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DEPARTMENT OF ANIMAL SCIENCE
ONE SHIELDS AVENUE
DAVIS, CALIFORNIA 95616.8521

TELEPHONE: (530) 752.9391

FAX: (530) 752-0175

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To: RB5 staff developing draft WDR for existing dairy operators

From: UC Dairy Quality Assurance Program Workgroup subcommittee for WDR document review:
Deanne Meyer, Ph.D. Livestock Waste Management Specialist/Research Scientist (UC Davis)
Marsha Campbell Mathews, Forage Advisor (Stanislaus County)
G. Stuart Pettygrove, Ph.D. Soil Specialist (UC Davis)
Carol Frate, Forage Advisor (Tulare County)
David Crohn, Ph.D. Assoc. Prof. Environmental Sciences; Assoc. CE Specialist Biosystems Engineering (UC Riverside)
Thomas Harter, Ph.D. Subsurface Hydrologist (UC Davis)

Researchers associated with the University of California Dairy Quality Assurance Workgroup have invested significant time to provide input into the development of the Existing Milk Cow Dairies WDR and associated documents. Our written comments herein are predominantly focused on the MRP and NMP (attachment C). Specific comments related to the groundwater component of the MRP will be delayed slightly.

Individuals participating in the preparation of document are familiar with soil science, geohydrology, dairy manure management, engineering, irrigation and salinity management, and dairy, forage and crop production. Many of us have participated in the Comprehensive Nutrient Management Plan Guidance development process at the request of the Natural Resources Conservation Service. Many of us have also served on the committee established by the University of California (the Land Grant University) to provide technical information to the Central Valley Regional Water Quality Control Board related to dairy nutrients (Committee of Experts Report). Combined the group has more than six decades of research experience working with dairy operators. During the last ten years significant improvements have occurred related to nutrient management during land application of manure.

Our comments are based on research and practical experiences. Recommendations for parameter analyses from various sources of plant, soil, manure, or water samples are located in the attached spreadsheet and highlighted in YELLOW.

Our comments will be general herein or related to other documents (other than the MRP and NMP). Very specific comments are in the two attached documents. We are available to meet with staff to explain any specific items that may remain unclear.

General comments:

The WDR should be to keep the requirements simple, straight forward and transparent to allow adoption. A producer or his/her consultant should be able to sit down and read through the document with relatively minimal frustration. Currently, it is not unusual for the many documents to refer to other areas in a document or in a separate document requiring the reader to flip back and forth. Table 1 of the Order (Schedule of deliverables) is independent of the NMP and MRP. Information identified in

Table 1 should be clearly delineated in the appropriate attachments. Both expectations for completion or reporting of milestones and the need for a special individual to complete the task should be included in the WMP and NMP. Comments were not inserted in all places but sufficient comments were inserted to provide staff with an example of how to make the document a bit easier to read.

The members of the workgroup focused on analysis of the MRP and NMP. We utilized Table 1 of the Order. This table was quite helpful. We would recommend that the information related to submittal dates, contents of submittal, and requirements for professional certification be included in the text component (i.e. MRP, NMP, or WMP, etc.) when the activity is defined. This would allow the reader to understand the timeline implications while they are reading the documents.

The Draft Preliminary Assessment spreadsheet should be modified to combine fields of like cropping patterns. The execution of this spreadsheet requires that each crop-field be entered as a separate row. If someone has 10 fields, with some double cropped and some triple cropped, then more than 20 crop-fields will need to be entered. Dairy operators who use a custom harvester may have whole farm tonnage and may or may not have field specific data. Additional time needed to gather field specific data will not yield markedly more precise information for the farm at this step. Labor saving opportunities at this first step are critical given that all producers must complete this task in the identified 4 months. The same recommendation would be made if producers were afforded 6 months for completion of this task. Individuals who possess and wish to provide such detailed information should be able to do so.

Record keeping is essential to the successful implementation of an NMP. As such, it is important that when documentation is required that the information be employed in the development or implementation of the NMP. Requiring unnecessary information will detract from the objective at hand---apply nutrients at appropriate rates to yield crops and be as protective as possible toward water resources. Example of unhelpful information—recording weather conditions at time of manure and process wastewater application and for 24 hours prior to and following applications. As the name implies, unhelpful data provide NO value to the operator. No decisions will be altered based on the data and no one will even analyze the data.

Maps are required at various times. It would be helpful to have a simple sentence “The objective(s) of this map is/are to …..” This helps the regulated entity understand the purposes of the maps. Logical information needed to describe the landowner include, name of agency and available information need to be provided when items need to be defined on a map that is not readily available to the operator. Where would a producer go to get specific types of maps and detailed information? The level of detail requested for the map due 4 months after adoption is not feasible. Find out from them NRCS what resources are available for mapping. Allowing generation of detailed information on maps over time will allow for quality control and more precise definition of information on maps. Requiring excessive amount of detail too soon will result in maps drawn that are not representative of the farming operation. Furthermore, alterations in infrastructure will also necessitate map modification/submission to RB 5. How often will maps need to be modified and what happens if a map is out-of-date?

Inconsistencies within the documents make it difficult to decipher the meaning of certain items. For example, WDR item 9. Page 2 identifies that Professionals at UC estimate the normal variation in California dairy herd sizes to range from 10 to 15 percent. Attachment E, P 2, item 14 has a different definition.

Comments related to Attachment E. Definitions:

Concise definitions are needed for the following terms: Irrigation event, field, drainage easement.

The term land application area is used to mean all the acreage under the control of the discharger as well as individual fields. It would reduce confusion to define the term field when appropriate.

“Mature dairy cow” is defined incorrectly. A cow is a bovine which has calved. A lactating animal is one currently lactating. A dry cow is a cow that is no longer lactating (typically in a resting phase before calving again). A mature dairy cow is a dairy animal in her third lactation or older (standard definition).

The definition of salt remains confusing.

“Discharge”: The term discharge is used to describe off-site discharge to surface water as well as the application of manure or manure water. Greater understanding of the document could be achieved if land application of manure/manure nutrients is differentiated from off-site discharges to surface water. “Freeboard” is defined incorrectly. Freeboard is the difference in elevation between the **maximum** level of liquid in a storage system and the lowest point of the embankment or overflow pipe. This area is intended to NEVER have liquid. NRCS has a standard definition.

Waste Management Plan Attachment B.
Section F. It is assumed that the objective of this map exercise is to identify perimeter, vulnerable areas for ground or surface water contamination and identify how/where manure is applied. F. 1 mentions requiring “wastewater discharge points”. It is unclear if this refers to each valve where liquid manure passes, fields, etc?

F. 4. If done, a separate map may be necessary to locate 600 ft domestic, or 1,500 feet municipal supply wells from the production area or land application areas. This information may not be available to non-land owners. RB should provide the viable source of information for the information required in this item.

What type of log is necessary for Monitoring and reporting – for A. 3 and 4.

Attachment C page 10 item 2. We recommend on a 3-5 year rolling average ---It is not a sound management practice to require crop deficiency to enable N application above crop removal. At this point (crop deficiency) crop yields and potential crop nutrient removal will be significantly impaired.

Page 3
Using table values for crop species is sufficient enough. This will reduce consultant billable hours and provide a precise estimate for most areas.

Please see comments and suggestions in Attachment C, MRP and spreadsheet.

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM NO._____

GENERAL ORDER
FOR
EXISTING MILK COW DAIRIES

This Monitoring and Reporting Program (MRP) is issued pursuant to California Water Code (CWC) Section 13267. The Discharger shall not implement any changes to this MRP unless a revised MRP is issued by the Executive Officer.

This MRP requires monitoring of discharges of manure and/or process wastewater, storm water, and tailwater from the production area and land application area and groundwater monitoring in order to determine if the Discharger's dairy is in compliance with the discharge limitations of Waste Discharge Requirements General Order No. ____ (Order). Discharge monitoring should be infrequent for those dairies that are operating in compliance with the Order.

The MRP also requires periodic visual inspections of the dairy to ensure the dairy is being operated and maintained to ensure continued compliance with the Order. In addition, the MRP requires monitoring of nutrients applied to, and removed from, land application areas in order for the Discharger to develop and implement a Nutrient Management Plan that will minimize leaching of nutrients and salts to groundwater and transport of these constituents to surface water.

The Discharger shall conduct monitoring and reporting as specified below.

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A. MONITORING PROVISIONS

Inspections

The results of inspections described below shall be recorded and the records shall be maintained on-site for a period of five years. Is this appropriately an exception report?~~.~~ One only needs to put it in writing when undesired activities are occurring. What type of documentation (record keeping activity) ~~-~~is expected from this activity.

1. The Discharger shall inspect the production area weekly during the rainy season including all waste storage areas and note any conditions or changes that could result in discharges to surface waters and/or from property under the control of the Discharger.

2. During and after each significant storm event[1], the Discharger shall make visual inspections of storm water containment structures. These structures shall be inspected for discharge, available remaining storage ~~freeboard~~, berm integrity,

[1] A significant storm event is defined as a storm event that results in continuous runoff of storm water for a minimum of one hour, or intermittent runoff for a minimum of three hours in a 12-hour period.

cracking, slumping, erosion, excess vegetation[1], evidence of burrowing animals animal burrows[2], and seepage.

3. Available storage capacity~~Freeboard~~ shall be measured weekly during the rainy season within each liquid manure storage structure ~~using a depth marker~~. [3]~~Freeboard~~ Existing storage capacity shall be the vertical distance from the pond surface to the ~~lowest~~ maximum liquid elevation line[4]~~of the surrounding berm or the bottom of the spillway and shall be measured to the nearest 0.25 foot (3 inches)~~.

4. The Discharger shall inspect land application areas immediately prior to commencement of application of process wastewater and daily when process wastewater is being applied and note: the conditions of the land application area berms including rodent holes, piping, and bank erosion; the presence (or lack) of field saturation, ponding, erosion, runoff (including tailwater discharges from the end of fields, pipes, or other conveyances), and nuisance conditions; and the conditions of any vegetated buffers or alternative conservation practices.[5]

Manure and Process Wastewater Monitoring

5. The Discharger shall monitor process wastewater and manure produced at the facility. This monitoring is for nutrient management and is expected to be part of the Nutrient Management Plan. Monitoring shall be performed to determine the nutrient and salt content of process wastewater and manure separately. Monitoring results shall be included in the Annual Monitoring Report (see Reporting Requirements B.2.n).

   a. Manure composite samples shall be collected and analyzed as specified in Monitoring Provisions A.25 and A.35 below, respectively. Manure shall be monitored for parameters 1 (volume or weight) and 21 (moisture content/wet weight) or 22 (density) each time applied to land under the Discharger's control or exported offsite, and at least quarterly for parameters[DM6] 2, 7, 8, 10, and 11 in Table 1. The total dry weight (tons) of manure applied annually to the land application area shall be recorded for each field.

   b. Process wastewater composite samples shall be collected and analyzed as specified in Monitoring Provisions A.26 and A.36 below, respectively. [DM7]Monitoring of process wastewater shall include, at a minimum, parameters 1, 2, 6, 7, 8, 10, and 11 in Table 1. Parameters 2, 6, 7, 8, 10, and 11 shall be monitored to determine the nutrient application to the land application area during at least one irrigation event each quarter (every three months) in which the process wastewater is applied to the land application area(s). Monitoring of nitrate-nitrogen (parameter 6) is only required if the retention pond is aerated. General minerals (parameter 13) shall be monitored when groundwater monitoring is required and at the frequency to be specified in the Monitoring Well Installation and Sampling Plan (MWISP). The volume (parameter 1) of process wastewater applied shall be measured to gauge the hydraulic application

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to the land application area during each irrigation event for each field no later than year x of this order. The process wastewater application dates and total gallons or acre-inches of process wastewater applied to each field shall be recorded for each application no later than year x of this order.

Irrigation Water and Water Use Monitoring

6. The Discharger shall monitor irrigation water that is used on all land application areas under the Discharger's control where manure and/or process wastewater is applied and shall assure monitoring of irrigation water when the irrigation is conducted where the Discharger's process wastewater is applied under a third party's control. The Discharger shall also monitor ~~rainfall and~~ crop water use at the dairy using information from the nearest California Irrigation Management Information System (CIMIS) weather station. Crop water use shall be determined using data on evapotranspiration from a standardized grass surface (ETo) from the CIMIS station and the crop coefficient method (University of California Cooperative Extension Publications 21427 and 21428 available at http://www.cimis.water.ca.gov/cimis/infoEtoCropCo.jsp) or equivalent procedure. This monitoring is for nutrient management and is expected to be part of the Nutrient Management Plan. Irrigation water shall be sampled at least two times during the irrigation season as follows:[DM8]

   a. At a minimum, one sample shall be collected at the beginning and another sample shall be collected at the end of the irrigation season during actual irrigation events.

   b. Canal and well water sources shall be considered separate supplies, each requiring sampling two times during actual irrigation seasons ~~event~~[DM9].

   c. Monthly samples shall be collected from canals during actual irrigation events if the canal is subject to water quality variations due to changes in supply water sources.

~~7.~~Irrigation water samples shall be collected and analyzed as specified in Monitoring Provisions A.27 and A.36 below, respectively. Irrigation water shall be monitored for parameters (1, 2, 6, 7, 8, 10, and 11) in Table 1. The dates and volume (parameter 1) of each irrigation application shall be monitored and recorded for each land application area (Early in the process (first year of data collection) application across all fields will be recorded. As the process progresses applications to each field at each irrigation may be a reasonable action.. ~~Daily rainfall (parameter 23) and crop water use (parameter 24) shall also be recorded.~~

Soil Monitoring

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~~8.~~7. At least once every five years, commencing with the first full calendar year regulated by the Order, the Discharger shall collect and analyze representative soil samples for parameters 2, 6, 7, 9, 10, and 11 in Table 1 from all land application areas under the Discharger's control where process wastewater and/or manure is applied and shall assure that soil is analyzed where the Discharger's process wastewater is applied under a third party's control.[10] Soil samples shall be collected following harvest of a crop and before nutrients are added for the following crop as specified in Monitoring Provision A.28 and analyzed as specified in Monitoring Provisions A.33 and A.34 below. The results of these analyses are to be used in determining application rates of manure and process wastewater to the land application area and are expected to be part of the Nutrient Management Plan. Monitoring results shall be included in the Annual Monitoring Report (see Reporting Requirements B.2.n).

Plant Tissue Monitoring

~~9.~~8. The Discharger shall monitor plant tissue (1) at harvest to determine the nutrients removed from each land application area where manure and/or process wastewater is applied and (2) if necessary[DM11], mid-season to assess the need for additional nitrogen and/or phosphorus fertilizer during the growing season. The total weight (tons) and wet weight (parameter 21) or the volume (cubic yards) and density (parameter 22) of the harvested material which is removed from each land application area shall be determined and recorded[12]. Plant tissue samples shall be collected and analyzed as specified in Monitoring Provisions A.29 and A.33 below, respectively. Plant tissue samples shall be monitored for parameters 9, 10, 11, and 21 (~~or 22~~) in Table 1.

Discharge and Surface Water Monitoring[DM13]

~~10.~~9. The Discharger shall record the date and the approximate time and volume of each off-property discharge of wastes from the production area or land application area and the approximate duration and amount of wastes discharged. Such discharges shall be reported in accordance with Reporting Requirement B.1, B.2.h, or B.2.j below as appropriate.

~~11.~~10. The Discharger shall record the date and the approximate time and volume of each discharge of storm water from the production area to surface water and the approximate duration of the discharge. Such discharge shall be reported in accordance with Reporting Requirements B.1 and B.2.i.

~~12.~~11. During or immediately after any overflow or other unauthorized off-site discharge of storm water to surface water or wastewater from a manure or process wastewater storage area, retention pond, corral or land application area, the Discharger shall collect samples of the discharge. If the discharge is to surface water, the Discharger shall also collect samples from surface water upstream[2] and downstream[3] of the

[2] Upstream samples shall be taken just far enough upstream so as not to be influenced by the discharge.

discharge. The Discharger shall record the estimated volume of the discharge and the date and time of the discharge. Discharges and surface water shall be monitored daily during each discharge event for parameters 2 through 8, 10 through 12, 14, 15, 18, and 19 in Table 1. Discharges shall also be monitored daily for volume (parameter 1). The results of such monitoring shall be reported in accordance with Reporting Requirements B.1 and B.2.m.

Note: If conditions are not safe for sampling, the Discharger must provide documentation of why samples could not be collected and analyzed. For example, the Discharger may be unable to collect samples during dangerous weather conditions (such as local flooding, high winds, tornados, electrical storms, etc.). However, once the dangerous conditions have passed, the Discharger shall collect a sample of the discharge or, if the discharge has ceased, from the waste management unit from which the discharge occurred.

Tailwater Monitoring[14]

~~13.~~12. The Discharger shall monitor and record each discharge of tailwater to surface water, at the point of discharge, from any land application area where irrigation has occurred less than 60 days after application of manure and/or process wastewater to that area[15]. A map showing the sample locations, and the method of measuring the flow must be provided in the Annual Report (see Reporting Requirement B.2.j below). Samples of discharges shall be analyzed as specified in Monitoring Provision A.36 below. Each discharge shall be monitored during each event at the point of discharge for parameters 1 through 8, 10, 11, 14, 15, 18, and 19 in Table 1. Each discharge shall be monitored daily at the point of discharge for total dissolved solids (parameter 12). The results of all tailwater monitoring shall be reported in accordance with Reporting Requirements B.2.j and B.2.m below.

Storm Water Monitoring

14. During the first twelve months following enrollment under the Order, the Discharger shall monitor discharges of storm water to surface water from each separate land application area that is identified in Item 1.A (See Attachment C) of the Discharger's Nutrient Management Plan. The monitoring shall include the following:

    a. Collection and analysis of grab samples from at least two storm events per wet season. The first sample shall be from the first storm event of the wet season that produces significant storm water discharge (continuous storm water runoff for a minimum of one hour, or intermittent storm water runoff for a minimum of three hours in a 12-hour period) and the second from a storm event that produces significant storm water discharge during the peak storm season (typically February) and that is preceded by at least three days of dry weather.

[3] Downstream samples shall be taken just far enough downstream where the discharge is blended with the receiving water but not influenced by dilution flows or other discharges.

The sample(s) should be taken during the first hour of the discharge. The samples shall be monitored for parameters 1, 2, 3, 4, 5, 6, 7, 8, 12, 14, 18, 19, and 20 in Table 1. The samples shall be analyzed as specified in Monitoring Provision A.36 below.

b. Sample locations must be chosen such that the samples are representative of the quality and quantity of storm water discharged. A rationale for the sample locations, a map showing the sample locations, and the method of measuring the storm water flow must be provided in the Annual Storm Water Monitoring Report (see Reporting Requirements B.4 below).

Documentation must be provided in the annual storm water monitoring report (required in the Reporting Requirements B.4 below) if no significant discharges of storm water from any of the land application areas occur, or if the Discharger is unable to collect any of the required samples due to adverse climatic conditions and/or inaccessibility to the discharge location.

If the Executive Officer does not approve reducing the constituents and/or sampling frequency for any land application area based on the first year of storm water monitoring report (see Reporting Requirements B.5 below), the Discharger shall continue the storm water monitoring in accordance with the requirements above.

Groundwater Monitoring[DM16]

The Discharger must sample each domestic and agricultural supply well and subsurface (tile) drainage system present in the production and/or land application areas to characterize existing groundwater quality. The Executive Officer will use groundwater monitoring data from four quarters of monitoring events and additional information to assess and determine the need for additional groundwater monitoring at a facility. Groundwater monitoring data together with factors in Table 2 of this Monitoring and Reporting Program will be used as a guide to prioritize where and when monitoring wells are to be installed. The Discharger must comply with the groundwater monitoring requirements below:

15. The Discharger shall immediately begin sampling each domestic and agricultural supply well present in the production and land application areas. These wells shall be sampled quarterly for parameters 6, 7, and 12 in Table 1. Monitoring of the supply wells may be reduced to annually after one year of quarterly data are provided to the Executive Officer or may continue at the same frequency if directed by the Executive Officer.

16. The Discharger shall immediately begin sampling discharges from each subsurface (tile) drainage system present in the land application area(s) quarterly for parameters 6, 7, and 12 in Table 1.

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Additional Groundwater Monitoring Requirements

17. When required by the Executive Officer, the Discharger shall install sufficient monitoring wells to:

    a. Characterize groundwater flow direction and gradient beneath the site;

    b. Characterize natural background (unaffected by the Discharger or others) groundwater quality upgradient of the facility; and

    c. Characterize groundwater quality downgradient of the corrals, downgradient of the retention ponds, and downgradient of the land application areas.

    It may be necessary to install more than one upgradient monitoring well (i.e., for the production area and the land application area). The Executive Officer may require more extensive monitoring based on site-specific conditions. The Executive Officer will prioritize installation of monitoring wells based on the factors identified in Table 2.

18. Prior to installation of monitoring wells, the Discharger shall submit to the Executive Officer a Monitoring Well Installation and Sampling Plan (MWISP) (see Attachment G) and schedule prepared under the direct supervision of, and certified by, a California registered civil engineer or a California registered geologist with experience in hydrogeology. Installation of monitoring wells shall not begin until the Executive Officer notifies the Discharger in writing that the MWISP is acceptable.

19. All monitoring wells shall be constructed in a manner that maintains the integrity of the monitoring well bore hole and prevents the well from acting as a conduit for pollutant/contaminant transport. The sampling interval of each monitoring well shall be appropriately screened and fitted with an appropriate filter pack to enable collection of representative groundwater samples of the first encountered groundwater.

20. The construction and destruction of monitoring wells and supply wells shall be in accordance with the standards under *Water Wells* and *Monitoring Wells* in the *California Well Standards Bulletin 74-90 (June 1991)* and *Bulletin 74-81 (December 1981),* adopted by the Department of Water Resources (DWR). Should any county or local agency adopt more stringent standards than that adopted by the DWR, then these local standards shall supercede the Well Standard of DWR, and the Discharger shall comply with the more stringent standards.

21. The horizontal and vertical position of each monitoring well shall be determined by a registered land surveyor or other qualified professional. The horizontal position of each monitoring well shall be measured with one-foot lateral accuracy using the North American Datum 1983 (NAD83 datum). The vertical elevations of each

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monitoring well shall be referenced to the North American Vertical Datum 1988 (NAVD88 datum) to an absolute accuracy of at least 0.5 feet and a relative accuracy between monitoring wells of 0.01 feet.

22. Within 45 days after completion of any monitoring well, the Discharger shall submit to the Executive Officer a Monitoring Well Installation Completion Report (MWICR) (see Attachment G) prepared under the direct supervision of, and certified by, a California registered civil engineer or a California registered geologist with experience in hydrogeology.

23. The Discharger shall sample monitoring wells quarterly for one year to establish background concentrations. Groundwater monitoring may be reduced to semi-annually once one year of quarterly groundwater monitoring data are provided to the Executive Officer. Groundwater monitoring shall include monitoring during periods of the expected highest and lowest water table levels. Groundwater monitoring shall include:

    a. Measurement of the depth to groundwater from a surveyed reference point to the nearest 0.010 foot in each monitoring well; and

    b. Analysis of groundwater samples from each well as specified in Monitoring Provision A. 36 below, for parameters 2, 5, 6, 7, 8, 10, 11, 12, and 13 in Table 1.

24. The Discharger shall submit to the Executive officer an evaluation of the groundwater monitoring data within six months of obtaining sufficient data to evaluate trends in the data (usually about 8 independent samples). The submittal shall include a description of the statistical or non-statistical methods proposed for use in evaluating the groundwater monitoring data. The proposed methods must be approved by the Executive Officer

Sampling Requirements[17]

The Discharger shall use sample containers and sample handling, storage, and preservation methods that are accepted or recommended by the selected analytical laboratory or, as appropriate, in accordance with approved United States Environmental Protection Agency analytical methods[DM18] or published by the University of California Dairy Quality Assurance Workgroup. The following sampling procedures are standards currently recognized by the Central Valley Water Board. [DM19] When special procedures appear to be necessary at an individual dairy, the Discharger may request approval of alternative sampling procedures for nutrient management. The Executive Officer will review such requests and if adequate justification is provided, may approve the requested alternative sampling procedures.

25. Manure samples shall be collected as follows:

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a. At least 10 equal-size samples of manure shall be collected from various portions of the manure pile, with most samples from the center. No more than two samples shall be collected from the surface and two from the bottom.

b. The 10 samples shall be placed in a container and mixed well before a subsample is placed in a clean container provided by or approved by the analytical laboratory that will receive the samples.

c. Sample containers that are reused shall be washed with soap and thoroughly rinsed with clean (tap) water.

26. Process wastewater composite samples shall be collected as follows:[DM20]

a. A representative composite sample of process wastewater shall be prepared based on a minimum of three time-series samples collected during an irrigation event that are representative of the beginning, middle, and end of the process wastewater discharge. These samples shall be combined in a single container, mixed, and poured into a clean container provided by or approved by the laboratory that will receive the samples. Containers that are reused shall be washed with soap and thoroughly rinsed with clean (tap) water.

b. The samples shall be collected at a point that is prior to any dilution or blending with irrigation water and shall be representative of the process wastewater applied to the land application area.

27. Irrigation water samples shall be collected as follows:

a. Samples shall be collected before the addition of process wastewater.

b. Samples from irrigation wells shall be collected after the pump has run for a minimum of 30 minutes or after at least three well volumes have been purged from the well.

28. Soil samples shall be collected as follows:

a. Composite samples shall be collected from each land application area receiving manure and/or process wastewater. Samples shall be composited by:

i. Placing equal volumes of soil from each of 10 or more sample sites for each land application area and sample depth, in a clean plastic bucket. Moist soils may be air dried until they can be mixed easily.

ii. Thoroughly mixing the sample and placing at least one pint of the composite sample in a clean plastic container to be shipped to the laboratory. The

laboratory should be consulted for the exact amount of sample and the sample container needed

b. At a minimum, composite samples shall be collected from a depth of 0 to ~~48~~ 18 inches. Samples from each site shall be split into four sections representing depth interval~~s~~ 0 to 18 ~~2~~ inches~~, 12 to 24 inches, 24 to 36 inches, and 36 to 48 inches~~. All samples from the same depth interval for all sites within each land application area shall be composited for analyses.

c. Soil samples shall be collected with soil probes or augers from a minimum of 10 sites in each land application area and composited as described below.

i. At least three of the 10 samples shall be from the upper third of the land application area.

ii. In fields where soil texture, crop yield, or other soil-related factors vary, at least 10 samples shall be collected from each different area and composites from each area shall be analyzed separately.

iii. Sample locations in each land application area shall be recorded on a sketch for future sampling consistency.

iv. Soil probes or augers shall be cleaned thoroughly between samples with gloved hands.[DM21]~~selected sample depth intervals with a non-residual detergent such as Alconox.~~

29. Plant tissue samples shall be collected as follows.

a. Harvest plant tissue samples shall be collected as follows:

i. At least 10 equal-size samples (for example, using a two- to three-pound coffee can) of the harvested portion of the crop shall be collected between the point of harvest and being pushed into storage facilities (for silage) and at the point of storage for drier materials ~~as the material is moved off of the field~~. These samples shall be combined and thoroughly mixed in a plastic bag, taking care not to allow drying.

ii. Samples shall be contained in sealed plastic bags to retain moisture content.

~~b.~~Mid-season plant tissue samples, if collected, shall be collected following University of California recommendations for the specific plant being tested. UC recommendations for mid-season plant tissue sampling are not available for some forage crops. The method/timing for collecting and processing plant samples for which this is the case can be obtained from professional society publications i.e. Soil Testing & Plant Analysis, 3rd edition, Soil Science Society of America, Madison WI. Form of nutrient to measure and interpretation of results can

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also be obtained from this publication. However, review by individuals knowledgeable with California conditions should occur. If this review process is needed by RB then UC DQAP workgroup will develop a process to accomplish such reviews. This would be similar to our review of technical manuscripts. It is important to note that for some nutrients/crop species, plant tissue levels have not been calibrated and field-verified under irrigated California conditions, so there is a degree of uncertainty in interpretation. Commercial laboratories often have their own in-house interpretation, which may have been obtained from other states or is loosely based on experience within California.

30. Samples of discharges, surface water, tailwater, and storm water shall be collected as specified above in Monitoring Requirements A.10 through A.14.

31. Groundwater samples from monitoring wells shall be collected as specified in an approved Monitoring Well Installation and Sampling Plan.

32. Groundwater samples from domestic wells shall be collected from the tap nearest to the pressure tank (and before the pressure tank if possible) after water has been pumped from this tap for 10 to 20 minutes. Groundwater samples from agricultural supply wells shall be collected after the pump has run for a minimum of 30 minutes or after at least three well volumes have been purged from the well.

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Analytical Requirements

33. Analyses of soil and plant tissue samples shall be conducted by: methods utilized by the North American Proficiency Testing (NAPT) Program or accepted by the University of California; and laboratories participating in the NAPT Program or other programs whose tests are accepted by the University of California. This shall include analysis for nitrate-nitrogen and ammonium-nitrogen utilizing the 1M potassium chloride extract of soil. [DM22]

34. Analyses of phosphorus in soil samples shall be performed using the method recommended by the University of California or the bicarbonate-P or Olsen_P test.

35. Analyses of manure shall be conducted by: methods utilized by the Manure Analyses Proficiency (MAP) Testing Program or accepted by the University of California; and laboratories participating in the MAP Testing Program or other programs whose tests are accepted by the University of California.

36. Analyses of process wastewater[DM23], irrigation water, tailwater, discharges, surface water, storm water, and groundwater samples shall be conducted by a laboratory certified for such analyses by the California Department of Health Services. These laboratory analyses shall be conducted in accordance with the Title 40 Code of

Federal Regulations Part 136 (*Guidelines Establishing Test Procedures for the Analysis of Pollutants*) or other test methods approved by the Executive Officer.

Record-Keeping Requirements

37. Dischargers shall maintain on-site for a period of five years from the date they are created all information as follows:

    a. All information necessary to document implementation and management of the minimum elements of the nutrient management plan (NMP);

    b. All records for the production area including;

        i. Records documenting the inspections required under Monitoring Provisions A.1, A.2, and A.3 above.

        ii. Records documenting any corrective actions taken to correct deficiencies noted as a result of the inspections required in Monitoring Provisions A.1, A.2, and A.3 above. Deficiencies not corrected in 30 days must be accompanied by an explanation of the factors preventing immediate correction;

        iii. Records of the date, time, and estimated volume of any overflow;

        iv. Records of mortality management and practices;

        v. Steps and dates when action is taken to correct unauthorized releases as reported in accordance with Reporting Requirement B.1 below; and

        vi. Records of monitoring activities and laboratory analyses conducted as required in Standard Provisions and Reporting Requirements D.5.

    c. All records for the land application area including:

        i. Expected and actual crop yields;

        ii. Identification of crop, acreage, and dates of planting and harvest for each field;

        iii. Dates, locations, and approximate weight and moisture content, or volume and density, of manure applied to each field;

        iv. Dates, locations, and volume of process wastewater applied to each field;

TENTATIVE

v. Weather conditions at time of manure and process wastewater applications and for 24 hours prior to and following applications;[DM24]

vi. Records documenting the inspections conducted required under Monitoring and Reporting Provisions A.4 above;

vii. Dates, locations, and test methods for soil, manure, process wastewater, irrigation water, and plant tissue sampling;

viii. Results from manure, process wastewater, irrigation water, soil, plant tissue, discharge (including tailwater), and storm water sampling;

ix. Explanation for the basis for determining manure or process wastewater application rates, as provided in the Technical Standards for Nutrient Management established by the Order (Attachment C);

x. Calculations showing the total nitrogen, phosphorus, and potassium to be applied to each field, including sources other than manure or process wastewater;

xi. Total amount of nitrogen, phosphorus, and potassium actually applied to each field, including documentation of calculations for the total amount applied;[DM25]

xii. The method(s) used to apply manure and/or process wastewater;

xiii. Dates of manure and/or process wastewater application equipment inspections; and

xiv. Records documenting any corrective actions taken to correct deficiencies noted as a result of the inspections required in Monitoring Provisions A.4 above. Deficiencies not corrected in 30 days must be accompanied by an explanation of the factors preventing immediate correction.

xv. Records of monitoring activities and laboratory analyses conducted as required in Standard Provisions and Reporting Requirements D.5.

d. A copy of the Discharger's site-specific NMP;

e. All Manure/Process Wastewater Tracking Manifest forms (Attachment D) which includes information on the manure hauler, destination of the manure, dates hauled, amount hauled, and certification; and

TENTATIVE

f. All analyses of manure, process wastewater, irrigation water, soil, plant tissue, discharges (including tailwater discharges), surface water, storm water, and groundwater.

General Monitoring Requirements

38. The Discharger shall comply with all the "Requirements Specifically for Monitoring Programs and Monitoring Reports" as specified in the Standard Provisions and Reporting Requirements.

39. All samples collected shall be representative of the volume and nature of the material being sampled.

40. All samples containers shall be labeled and records maintained to show the time and date of collection as well as the person collecting the sample and the sample location.

41. All samples collected for laboratory analyses shall be preserved and submitted to th[DM26]e laboratory within the required holding time appropriate for the analytical method used and the constituents analyzed.

42. All samples submitted to a laboratory for analyses shall be identified in a properly completed and signed Chain of Custody form.

43. Field test instruments used for pH, electrical conductivity and dissolved oxygen may be used provided:

    a. The operator is trained in the proper use and maintenance of the instruments;

    b. The instruments are field calibrated prior to each monitoring event; and

    c. Instruments are serviced and/or calibrated by the manufacturer at the recommended frequency.

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TABLE 1. MONITORING PARAMETERS				
Parameter		Units		Type of Analysis
		Liquid Materials[4]	Solid Materials[5]	
1.	Volume or Weight[6]	Gallons or Acre-inches	Tons	Field[7]
2.	Electrical Conductivity	μmhos/cm[8]	μmhos/cm	Field/Laboratory[9]
3.	Dissolved Oxygen	mg/l[10]	NA[11]	Field
4.	Temperature	°F	NA	Field
5.	pH	pH units	pH units	Field/Laboratory[12]
6.	Nitrate-Nitrogen	mg/l	mg/kg[13]	Laboratory
7.	Ammonium-Nitrogen/Total Ammonia-Nitrogen and Unionized Ammonia-Nitrogen[14]	mg/l	mg/kg	Laboratory
8.	Total Kjeldahl Nitrogen	mg/l	mg/kg	Laboratory
9.	Total Nitrogen	mg/l	mg/kg	Laboratory
10.	Phosphorus[15]	mg/l	mg/kg	Laboratory
11.	Potassium	mg/l	mg/kg	Laboratory
12.	Total Dissolved Solids	mg/l	mg/kg	Laboratory
13.	General Minerals[16]	mg/l	mg/kg	Laboratory
14.	BOD_5[17]	mg/l	NA	Laboratory
15.	Total Suspended Solids	mg/l	NA	Laboratory
16.	Iron	mg/l	NA	Laboratory
17.	Manganese	mg/l	NA	Laboratory
18.	Total Coliform	MPN/100 ml[18]	NA	Laboratory
19.	Fecal Coliform	MPN/100 ml	NA	Laboratory
20.	Turbidity	NTU	NA	Laboratory
21.	Moisture Content/Wet Weight[19]	NA	percent	Laboratory
22.	Density[20]	NA	g/l[21]	Laboratory
23.	Rainfall	inches[22]	NA	CIMIS[23]
24.	Crop Water Use	Inches	NA	CIMIS

TENTATIVE

[4] Liquid materials include process wastewater, irrigation water, tailwater, storm water, and surface water.
[5] Solid materials include manure, soil, and plant tissue.
[6] Volume or weight of waste application or discharge.
[7] These parameters are to be measured in the field.
[8] Micromhos per centimeter (μmhos/cm).
[9] Electrical conductivity of: 1) liquid materials may be field measurements and 2) solid materials shall be laboratory measurements.
[10] Milligrams per liter (mg/l).
[11] NA – not applicable.
[12] pH shall be determined by laboratory analysis for soil and manure. pH for all other types of samples may be by field measurements.
[13] Milligrams per kilogram (mg/kg).
[14] Samples of soil, manure, process wastewater, irrigation water, and groundwater shall be analyzed for ammonium-nitrogen. Samples of discharges of process wastewater, storm water, and tailwater to surface water and samples of surface water shall be analyzed for total ammonia-nitrogen and unionized ammonia-nitrogen.
[15] Samples of manure, process wastewater, irrigation water, groundwater, and discharges of process wastewater, storm water, and tailwater to surface water shall be analyzed for total phosphorus. Samples of soil shall be analyzed for soluble phosphorus as required in A.34.
[16] General minerals include calcium, magnesium, sodium, bicarbonate, carbonate, sulfate, and chloride reported individually.
[17] Five-day Biochemical Oxygen Demand.
[18] Most probable number, five dilutions minimum.
[19] Manure shall be analyzed for moisture content (percent) when the amount of manure applied to a land application area or exported is expressed in weight (i.e., tons). Plant tissue shall be analyzed for wet weight (percent) when the amount harvested is reported in weight (i.e., tons), but the constituent analyses expressed on a dry weight basis.
[20] Manure density shall be analyzed when the amount of manure applied to a land application area or exported is expressed in volume (i.e., cubic yards). Plant density shall be analyzed when the amount harvested is expressed in volume (i.e., cubic yards).
[21] Grams per liter (g/l).
[22] Rainfall shall be reported to the nearest tenth of an inch.
[23] California Irrigation Management Information System (CIMIS) data from the nearest station..

TABLE 2. GROUNDWATER MONITORING FACTORS FOR RANKING PRIORITY[24]			
FACTOR	**SITE CONDITION**	**POINTS**	**SCORE**
Highest nitrate concentration (nitrate-nitrogen in mg/l) in any existing domestic well, agricultural supply well, or tile drainage system at the dairy or associated land application area (detected two or more times in any one well or tile drainage system).*	< 10	0	
	10 - 20	10	
	>20	20	
Ammonium (ammonium-nitrogen in mg/l) detected twice at any concentration in any existing domestic well, agricultural supply well, or tile drainage system at the dairy or associated land application area.*	< detection limit[25]	0	
	≥ detection limit	20	
Location of production area or land application area relative to a Department of Pesticide Groundwater Protection Area[26] (GWPA).	Outside GWPA	0	
	In GWPA	20	
Distance (feet) of production area or land application area from an artificial recharge area[27] as identified in the California Department of Water Resources Bulletin 118 or by the Executive Officer.	> 1,500	0	
	601 to 1,500	10	
	0 to 600	20	
Nitrate concentration (nitrate-nitrogen in mg/l) in domestic well on property adjacent to the dairy production area or land application area (detected two or more times).	< 10 or unknown	0	
	10 or greater	20	
Distance (feet) from dairy production area or land application area and the nearest off-property domestic well.*	> 600	0	
	301 to 600	10	
	0 to 300	20	
Distance (feet) from dairy production area or land application area and the nearest off-property municipal well.*	> 1,500	0	
	601 to 1,500	10	
	0 to 600	20	
Number of crops grown per year per field.*	1	5	
	2	10	
	3	15	
Nutrient Management Plan completed by **[24 months after adoption of the Order]**?*	Yes	0	
	No	100	
Whole Farm Nitrogen Balance[27].[28]*	~~<1.5~~<3	0	
	~~1.5 to~~ 3 to 5	10	
	>~~3~~5	20	
		Total Score: _____	

* This information will be provided by the Discharger. All other information will be obtained by the Executive Officer.

[24] Information on each factor may not be available for each facility. Total scores will be the ratio of the points accumulated to the total points possible for each facility. Dairies with higher total scores will be directed to install monitoring wells first.
[25] The detection limit for ammonium-nitrogen shall not exceed 1.5 mg/l.
[26] The Department of Pesticide Regulation (DPR) defines a Groundwater Protection Area (GWPA) as an area of land that is vulnerable to the movement of pesticides to groundwater according to either leaching or runoff processes. These areas include areas where the depth to groundwater is 70 feet or less. The DPR GWPAs can be seen on DPRs website at http://www.cdpr.ca.gov/docs/gwp/gwpamaps.htm.
[27] An artificial recharge area is defined as an area where the addition of water to an aquifer is by human activity, such as putting surface water into dug or constructed spreading basins or injecting water through wells.
[28] The Whole Farm Nitrogen Balance is to be determined as the ratio of (Nitrogen generated + Nitrogen imported)/(Nitrogen Removed by Crops and Exported) as reported in the Preliminary Dairy Facility Assessment in the Existing Conditions Report (Attachment A).

TENTATIVE

B. REPORTING REQUIREMENTS

Noncompliance Reporting

1. The Discharger shall report any noncompliance that endangers human health or the environment or any noncompliance with Prohibitions A.1, A.2, A.3, A.4, A.5, A.8, A.9, A.10, A.11, and A.12 in the Order, within 24 hours of becoming aware of its occurrence. The incident shall be reported to the Central Valley Water Board Office, local environmental health department, and to the California Office of Emergency Services (OES). During non-business hours, the Discharger shall leave a message on the Central Valley Water Board's voice mail. The message shall include the time, date, place, and nature of the noncompliance, the name and number of the reporting person, and shall be recorded in writing by the Discharger. The OES is operational 24 hours a day. A written report shall be submitted to the Central Valley Water Board office within two weeks of the Discharger becoming aware of the incident. The report shall contain a description of the noncompliance, its causes, duration, and the actual or anticipated time for achieving compliance. The report shall include complete details of the steps that the Discharger has taken or intends to take, in order to prevent recurrence. All intentional or accidental spills shall be reported as required by this provision. The written submission shall contain:

    a. The approximate date, time, and location of the noncompliance including a description of the ultimate destination of any unauthorized discharge and the flow path of such discharge to a receiving water body.

    b. A description of the noncompliance and its cause;

    c. The flow rate, volume, and duration of any discharge involved in the noncompliance;

    d. The amount of precipitation (in inches) the day of any discharge and for each of the seven days preceding the discharge;

    e. A description (location; date and time collected; field measurements of pH, temperature, dissolved oxygen and electrical conductivity; sample identification; date submitted to laboratory; analyses requested) of noncompliance discharge samples and/or surface water samples taken to comply with Monitoring Provision A.12;

    f. The period of noncompliance, including dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and

    g. A time schedule and a plan to implement corrective actions necessary to prevent the recurrence of such noncompliance.

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The laboratory analyses of the noncompliance discharge sample and/or upstream and downstream surface water samples shall be submitted to the Central Valley Water Board office within 45 days of the discharge.

Annual Reporting

An annual monitoring report covering the 12-month period beginning 1 November and ending 31 October of the following year shall be submitted to the Executive Officer by **[12 months after adoption of the Order] of each year**. For application and uptake information to be meaningful, it is important that crop seasons not be split. Under the current requirements, applications to the winter crop in one year would be reported in another. This will make it very difficult to assess if appropriate rates were applied to the crop. Furthermore, ~~It also very much complicates~~ recordkeeping becomes exponentially complicates as ~~because~~ recordkeeping software is designed to track applications on a crop by crop basis and the data needed for the permit report would be found in different years. This unnecessarily complicates recordkeeping, makes it difficult to assess the appropriateness of applications, makes it easy to "hide" inappropriate applications, and generates a report that is meaningless for farming decisions.

The reporting year should follow the crop year. The crop year begins immediately after the harvest of the last summer or fall crop on a particular field, and ends with the harvest of the next summer of fall crop, whichever is later. The report start and end dates ~~is~~are reported for each field and the end date of this year's report is the beginning of the next year's report. Anything applied after harvest is reported on the next year's report. This system is intuitive and will generate meaningful data for both the operator and the regulatory agency, and is compatible with available recordkeeping software.

~~2.~~ The annual report shall be completed on an annual report form provided by the Executive Officer (available on the Central Valley Water Board website at http://www.waterboards.ca.gov/centralvalley/available_documents/index.html#confined) and shall include all the information as specified below.

a. An updated Preliminary Dairy Facility Assessment using the tool provided in Attachment A.

b. Number and type of animals, whether in open confinement or housed under roof;

c. Estimated amount of total manure (tons) and process wastewater (gallons or acre-inches) generated by the facility in the previous 12 months;

d. Estimated amount of total manure (tons) and process wastewater (gallons or acre-inches) applied over the previous 12 months to each land application area identified in 3.f below;

TENTATIVE

e. Estimated amount of total manure (tons) and process wastewater (gallons or acre-inches) transferred to other persons by the facility in the previous 12 months;

f. Total number of acres and the Assessor Parcel Numbers for all land application areas covered by the Nutrient Management Plan;

g. Total number of acres and the Assessor Parcel Numbers of property that were used for land application of manure and process wastewater in the previous 12 months;

h. Summary of all manure and process wastewater discharges from the production area to surface water or to land areas (land application areas or otherwise) when not in accordance with the facility's Nutrient Management Plan that have occurred in the previous 12 months, including date, time, location, approximate volume, a map showing discharge and sample locations, rationale for sample locations, and method of measuring discharge flows;

i. Summary of all storm water discharges from the production area to surface water in the previous 12 months, including the date, time, approximate volume, duration, location, and a map showing the discharge and sample locations, rationale for sample locations, and method of measuring discharge flows.

j. Summary of all discharges from the land application area to surface water that have occurred in the previous 12 months, including the date, time, approximate volume, location, source of discharge (i.e., tailwater, process wastewater, or blended process wastewater), a map showing the discharge and sample locations, rationale for sample locations, and method of measuring discharge flows;

k. A statement indicating if the NMP has been updated and whether the current version of the facility's NMP was developed or approved by a certified nutrient management planner as specified in Attachment C of the Order;

l. Copies of all manure/process wastewater tracking manifests for the reporting period;

m. Copies of laboratory analyses of all discharges (manure, process wastewater, or tailwater), surface water (upstream and downstream of a discharge), and storm water, including chain-of-custody forms and laboratory quality assurance/quality control results;

n. Tabulated analytical data for samples of manure, process wastewater, irrigation water, soil, and plant tissue. The data shall be tabulated to clearly show sample dates, constituents analyzed, constituent concentrations, and detection limits.

TENTATIVE

o. Results of the Record-Keeping Requirements for the production and land application areas specified in Monitoring Provisions A.37.b.ii, A.37.b.iii, A.37.c.i, A.37.c.ii, A.37.c.iii, A.37.c.iv, A.37.c.v, A.37.c.xi, and A.37.c.xiv above.

p. Information on farm nutrient balance should be included.

Groundwater Reporting

3. The Discharger shall report the results of all groundwater monitoring annually by **30 June** each year. Groundwater monitoring reports shall include all laboratory analyses (including chain-of-custody forms and laboratory quality assurance/quality control results) and tabular and graphical summaries of the monitoring data. Data shall be tabulated to clearly show the sample dates, constituents analyzed, constituent concentrations, detection limits, depth to groundwater, and groundwater elevations. Graphical summaries of groundwater gradients and flow directions shall also be included. Each groundwater monitoring report shall include a summary data table of all historical and current groundwater elevations and analytical results. The groundwater monitoring reports shall be certified by a California registered professional as specified in General Reporting Requirements C.9 of the Standard Provisions and Reporting Requirements of the Order.

Storm Water Reporting

4. The Discharger shall submit an annual report by **30 June** of each year that details the results of the previous year's storm water monitoring, including the Discharger's preparation for the upcoming wet season for all land application areas. The annual report shall include a map showing all sample locations for all land application areas, rationale for all sampling locations, a discussion of how storm water flow measurements were made, the results (including the laboratory analyses, chain of custody forms, and laboratory quality assurance/quality control results) of all samples of storm water, a summary of events during the year that contributed pollutants to storm water from any land application area, and any modifications made to the facility or sampling plan in response to pollutants detected in storm water. The annual report must also include documentation if no significant discharge of storm water occurred from the land application area(s) or if it was not possible to collect any of the required samples or perform visual observations due to adverse climatic conditions.

5. The first year storm water report shall include an assessment of the storm water monitoring results for any land application area where monitoring was necessary. If the first year of storm water monitoring for any land application area indicates pollutants have not been detected in storm water samples, the Discharger may propose to the Executive Officer to reduce the constituents and/or sampling frequency for that area.

TENTATIVE

General Reporting Requirements

6. The results of any monitoring conducted more frequently than required at the locations specified herein shall be reported to the Central Valley Water Board.

7. Laboratory analyses for manure, process wastewater, and soil shall be submitted to the Central Valley Water Board upon request by the Executive Officer.

8. Each report shall be signed by the Discharger or a duly authorized representative as specified in the General Reporting Requirements C.7 of the Standard Provisions and Reporting Requirements (SPRR), and shall contain the following statement:

   "*I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.*"

9. For facilities in Fresno, Kern, Kings, Madera, Mariposa, and Tulare counties, submit reports to:

   California Regional Water Quality Control Board
   Central Valley Region
   1685 E Street
   Fresno, CA 93706
   Attention: Confined Animal Regulatory Unit

   For facilities in Butte, Lassen, Modoc, Plumas, Tehama, and Shasta counties, submit reports to:

   California Regional Water Quality Control Board
   Central Valley Region
   415 Knollcrest Drive, Suite 100
   Redding, CA 96002
   Attention: Confined Animal Regulatory Unit

   For facilities in all other counties, submit reports to:

   California Regional Water Quality Control Board
   Central Valley Region
   11020 Sun Center Drive #200
   Rancho Cordova, CA 95670
   Attention: Confined Animal Regulatory Unit

TENTATIVE

ORDERED BY: _____
PAMELA C. CREEDON, Executive Officer

_____
Date

TENTATIVE

Page: 2
[1]Suggest that excess vegetation be removed here. Vegetation in the winter can minimize erosion however it must be managed to not develop into mosquito habitat in spring and summer.

Page: 2
[2]Burrows may be evident when animals aren't present.

Page: 2
[3]Suggest deleting this item. This should be done as a good management issue but should not require a paper trail. If this remains, suggest inserting during the rainy season after weekly. If someone has more than adequate storage and they don't record that they inspected their storage then they have violated the order.

Page: 2
[4]Freeboard definition and use are inconsistent with an engineer definition and with NRCS.
Page: 2
[5]Suggest deleting this item. This should be done as a good management issue but should not require a paper trail. If it is required as per the CAFO rule, then there should be an ability to do exception reports.

[DM6]There is tremendous question regarding the efficacy of mandating quarterly samples when an operator only irrigates for 3 months summer and 3 months winter. If an operator is not irrigating quarterly samples are not appropriate.
[DM7]Recommendations for sample parameter evaluation are identified in the spreadsheet.
[DM8]UC workgroup recommends that a standard set of Eto be summarized into tabular format based on plant date and that this information be used to estimate water use. Requiring each operator to obtain such information will have limited utility in nutrient management plan implementation. There may be some information gained. However, in the greater scheme it will have limited utility in the decision making process or the final results. Page: 3
[DM8]Annual total crop water ET varies minimally from year to year. Table value is sufficient to calculate irrigation efficiency. ****Measurement accuracy for application volumes will not improve irrigation efficiency calculations. Table value is sufficient. Reducing recording requirements here benefits the cost of the NMP.

[DM9]We presume it is not desirable to sample fresh water sources at each irrigation on each field.
Page: 4
[10]There is tremendous discussion regarding the utility of soil sampling. The NMP should be modified over time to identify the appropriate frequency of monitoring for soil, water, tissue, etc to determine nutrient application rates. Soil P values may well be useful to determine if P saturation exists in soil. It is unlikely that results will be used for estimating nutrient application rates.

[DM11]Page: 4
[DM11]It is unclear what "if necessary" implies. It is not a sound management practice to require crop deficiency to enable N application above crop removal. At this point (crop deficiency) crop yields and potential crop nutrient removal will be significantly impaired.

Page: 4
[12]This material is not typically weighed at field but weighed as it is being ensiled. It may not be possible to get samples collected by land application area. There are safety concerns related to sampling on a field by field basis. Also, at the end of the field when trucks are partially full the driver will move to the next field. This data collection activity will need to be modified.

[DM13]This section will lead to great confusion.
Page: 5
[14]See spreadsheet on recommended parameters for analyses.

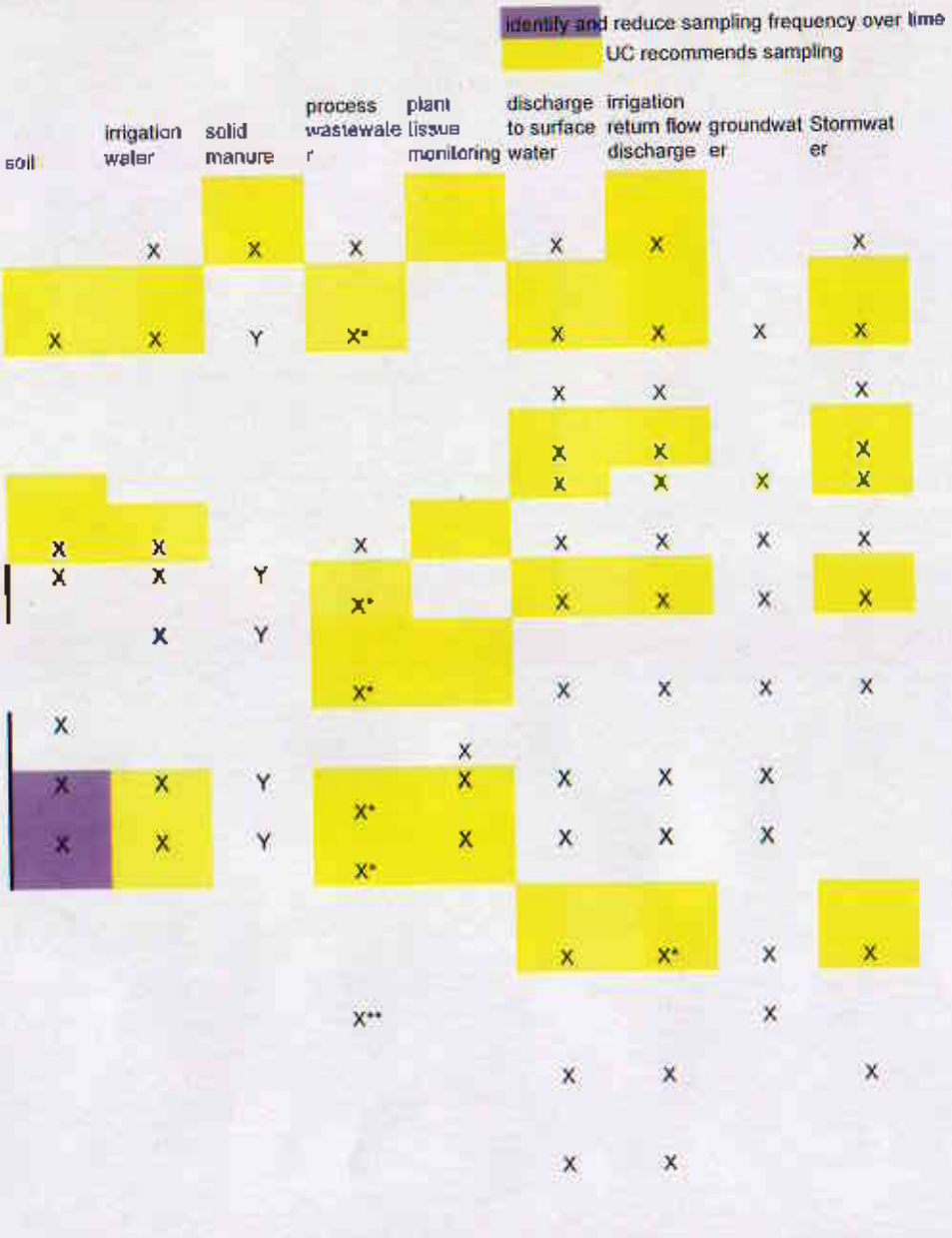
Page: 5
[15]Producers are obligated to be sure that they do not discharge nutrients regardless of when the nutrients were applied. The wording implies that it is acceptable to discharge off-site as long as 60 days lapsed.

[DM16]Comments from UC related to groundwater monitoring will be slightly delayed.
Page: 8
[17]The University of California is a large organization. Individuals with technical knowledge related to manure and nutrient management work collaboratively in the Dairy Quality Assurance Workgroup. This group is the appropriate group from within the University for the Regional Board to obtain information.
[DM18]US EPA does not have approved methods for manure streams.
[DM19]These "standards" recognized by RB currently ignore documents written in the last decade from UC related to sampling and analyses.
[DM20]It is unlikely that there are circumstances when UC would recommend a composite sample be taken for liquid manure streams. This is technically not a sound recommendation due to challenges in adequately mixing and splitting samples.
[DM21]Use of detergent to clean probe between selected sample depth intervals is overkill and would be useful only if done in combination with special steps taken to prevent movement of soil within the probe or auger hole. Some small amount of soil mixing among depths is practically impossible to avoid. The normal way to limit cross contamination between depths is care in insertion and removal of probe and wiping the probe clean between insertions with a damp cloth. The small amount of cross-depth mixing that occurs can be dealt with by sample homogenization during prep in the laboratory.
[DM22]The level of detail provided here is excessive compared to other areas. FYI, results with 2M KCl will be fine if standards are made appropriately. Why the restriction to 1M KCl?
[DM23]Workgroup recommends to move the process wastewater into item 35. Be advised, that the lab programs do not provide QAQC per se. Those listed in 35 merely identify a lab is participating and imply nothing about the quality of the laboratory's work.

[DM24]Weather information is available should an individual need to obtain it. There is no utility from the point of view of the operator to record this information.
[DM25]Spreadsheets have assumptions in them. What is RB staff expecting to see as a result of calculations for total amount applied?
[DM26]If the required parameters are not altered there will be times when actually multiple samples will need to be collected and parts preserved with different acids to allow analyses at a later date. Preservation of samples (acidification of manures) on farm should NOT be required.
Page: 16
[27]A balance is a comparison of inputs to outputs. The whole farm balance compares inputs of nutrients into the farm to managed outputs from the farm (animals, milk, manure, crop). This assumes the inputs are brought onto the property and the outputs are removed from the property. The Balance value of 1.5 is unachievable on a farm-wide basis. The N generated value is in fact a manure excretion value and does not account for unavoidable N losses during manure collection, transfer, storage and treatment. The Committee of Experts report provided to RB 5 identified a reasonable range of unavoidable losses between 25 to 40% of excreted N.

TABLE 1. MONITORING PARAMETERS

	Parameter	Units: Liquid Material	Units: Solid Materials	Type of Analysis	5 yr cycle
1	Volume or	Gallons or Acre-inches	Tons	Field[7]	
2	Electrical Conductivity	mhos/cm[8]	μmhos/cm	Field/Laboratory	x
3	Dissolved Oxygen	mg/l[10]	NA[11]	Field	
4	Temperature	°F	NA	Field	
5	pH	pH units	pH units	Laboratory[12]	
6	Nitrate-Nitrogen	mg/l	mg/kg[13]	Laboratory	
7	Ammonia-	mg/l	mg/kg	Laboratory	x
8	Total Kjeldahl Nitrogen	mg/l	mg/kg	Laboratory	x4
9	Total Nitrogen	Mg/l	mg/kg	Laboratory	
10	Phosphorus[15]	mg/l	mg/kg	Laboratory	x
11	Potassium	mg/l	mg/kg	Laboratory	x
12	Total Dissolved Solids	mg/l	mg/kg	Laboratory	
13	General M	mg/l	mg/kg	Laboratory	
14	BOD5[17]	mg/l	NA	Laboratory	
15	Total Suspended Solids	mg/l	NA	Laboratory	
16	Iron	mg/l	NA	Laboratory	



17	Manganese	mg/l	NA	Laboratory
18	Total Coliform	MPN/100 ml[	NA	Laboratory
19	Fecal Coliform	MPN/100 ml	NA	Laboratory
20	Turbidity	NTU	NA	Laboratory
21	Moisture C	NA	percent	Laboratory
22	Density[20]	NA	g/l[21]	Laboratory
23	Rainfall	inches[22]	NA	CIMIS[23]
24	Crop Water Use	inches	NA	CIMIS

								X	X		X
								X	X		X
											X
			X		X						
					X						
			X		X						
X											
X											

X = when applied

Y = quarterly

Used to determine nutrient application during at least one irrigation event per quarter (if land application occurs during that quarter)

** When groundwater monitoring is required, as specified in MWISP.

Monitoring should occur daily during discharge event.

*Should be monitored daily during discharge event.

Also: depth to groundwater from a surveyed reference point to the nearest 0.01 ft

Additionall
y: total dry
weight
applied
annually

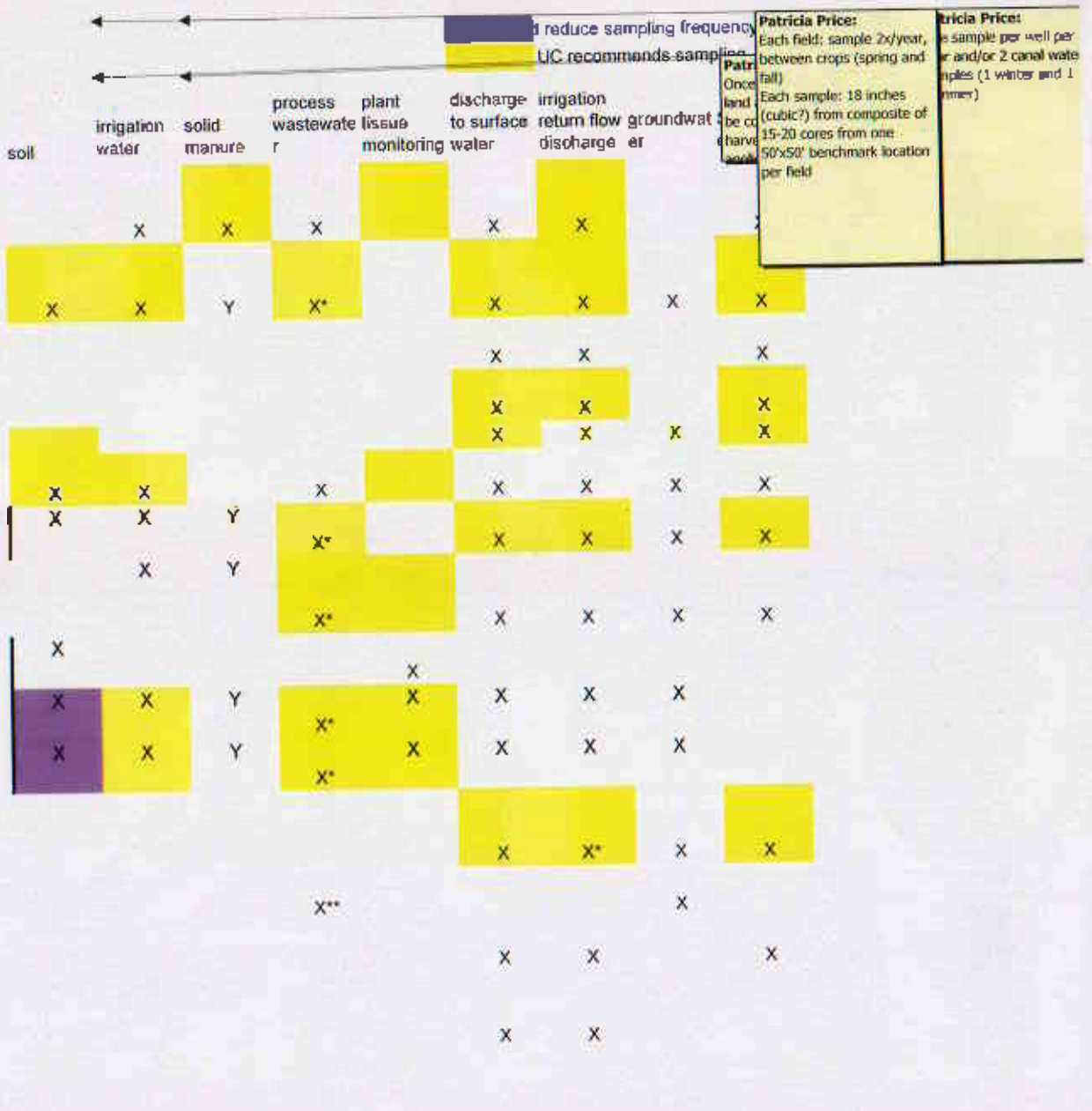
[4] Liquid materials include process wastewater, irrigation water, irrigation return flows, storm water, and surface water.
[5] Solid materials include manure, soil, and plant tissue.
[6] Volume or weight of waste application or discharge.
[7] These parameters are to be measured in the field.
[8] Micromhos per centimeter (µmhos/cm).
[9] Electrical conductivity of: 1) liquid materials may be field measurements and 2) solid materials shall be laboratory measurements.
[10] Milligrams per liter (mg/l).
[11] NA – not applicable.
[12] pH shall be determined by laboratory analysis for soil an dmanure, pH for all other types of samples may be by field measurements.
[13] Milligrams per kilogram (mg/kg).
[14] Samples of soil, manure, process watewater, irrigation water, and groundwater shall be analyzed for ammonium-nitrogen. Samples of discharges of process wastewater, storm water, tailwater to surface water and samples of surface water shall be analyzed for total ammonia-nitrogen and unionized ammonia-nitrogen.
[15] Samples of manure, process watewater, irrigation water, groundwater, and discharges of process wastewater, storm water, and tailwater to surface water shall be analyzed for total phosphorus. Samples of soil shall be analyzed for soluble phosphorus as required in A.34.
[16] General minerals include calcium, magnesium, sodium, bicarbonate, carbonate, sulfate, and chloride reported individually.
[17] Five-day Biochemical Oxygen Demand.
[18] Most probable number, five dilutions minimum.
[19] Manure shall be analyzed for moisture content (percent) when the amount of manure applied to a land application area or exported is expressed in weight (i.e., tons). Plant tissue shall be analyzed for wet weight (percent) when the amount harvested is reported in weight (i.e., tons), but the constituent analyses expressed on a dry weight basis.
[20] Manure denisty shall be analyzed when the amount of manure applied to a land application area or exported is expressed in volume (i.e., cubic yards). Plant denisty shall be analyzed for denisty when the amount harvested is reported in volume (i.e., tons).
[21] Grams per liter (g/l).
[22] Rainfall shall be reported to the nearest tenth of an inch.
[23] California Irrigation Management Information System (CIMIS) data from the nearest station.

TABLE 1. MONITORING PARAMETERS

	Parameter	Units: Liquid Material	Units: Solid Material	Type of Analysis	5 yr cycle
1	Volume or	Gallons or Acre-inches	Tons	Field[7]	
2	Electrical Conductivity	mhos/cm[8]	µmhos/cm		
3	Dissolved Oxygen	mg/l[10]	NA[11]	Field	
4	Temperature	°F	NA	Field	
5	pH	pH units	pH units		
6	Nitrate-Nitrogen	mg/l	mg/kg[13]		
7	Ammonia-[14]	mg/l	mg/kg		
8	Total Kjeldahl Nitrogen	mg/l	mg/kg	Laboratory	x4
9	Total Nitrogen	Mg/l	mg/kg	Laboratory	
10	Phosphorus[15]	mg/l	mg/kg	Laboratory	x
11	Potassium	mg/l	mg/kg	Laboratory	x
12	Total Dissolved Solids	mg/l	mg/kg	Laboratory	
13	General M	mg/l	mg/kg	Laboratory	
14	BOD5[17]	mg/l	NA	Laboratory	
15	Total Suspended Solids	mg/l	NA	Laboratory	
16	Iron	mg/l	NA	Laboratory	

DMeyer: requires different sample preservation that parameter 7

DMeyer: K analysis important prior to applying fertilizer--however not necessarily a mandatory component of WDR



17	Manganese	mg/l	NA	Laboratory
18	Total Coliform	PN/100 ml[	NA	Laboratory
19	Fecal Coliform	MPN/100 ml	NA	Laboratory
20	Turbidity	NTU	NA	Laboratory
21	Moisture C	NA	percent	Laboratory
22	Density[20]	NA	g/l[21]	Laboratory
23	Rainfall	inches[22]	NA	CIMIS[23]
24	Crop Water Use	inches	NA	CIMIS

X X X

X X X

X

X X

X X

X

X

X = when applied

Y = quarterly

Used to determine nutrient application during at least one irrigation event per quarter (if land application occurs during that quarter)

** When groundwater monitoring is required, as specified in MWISP.

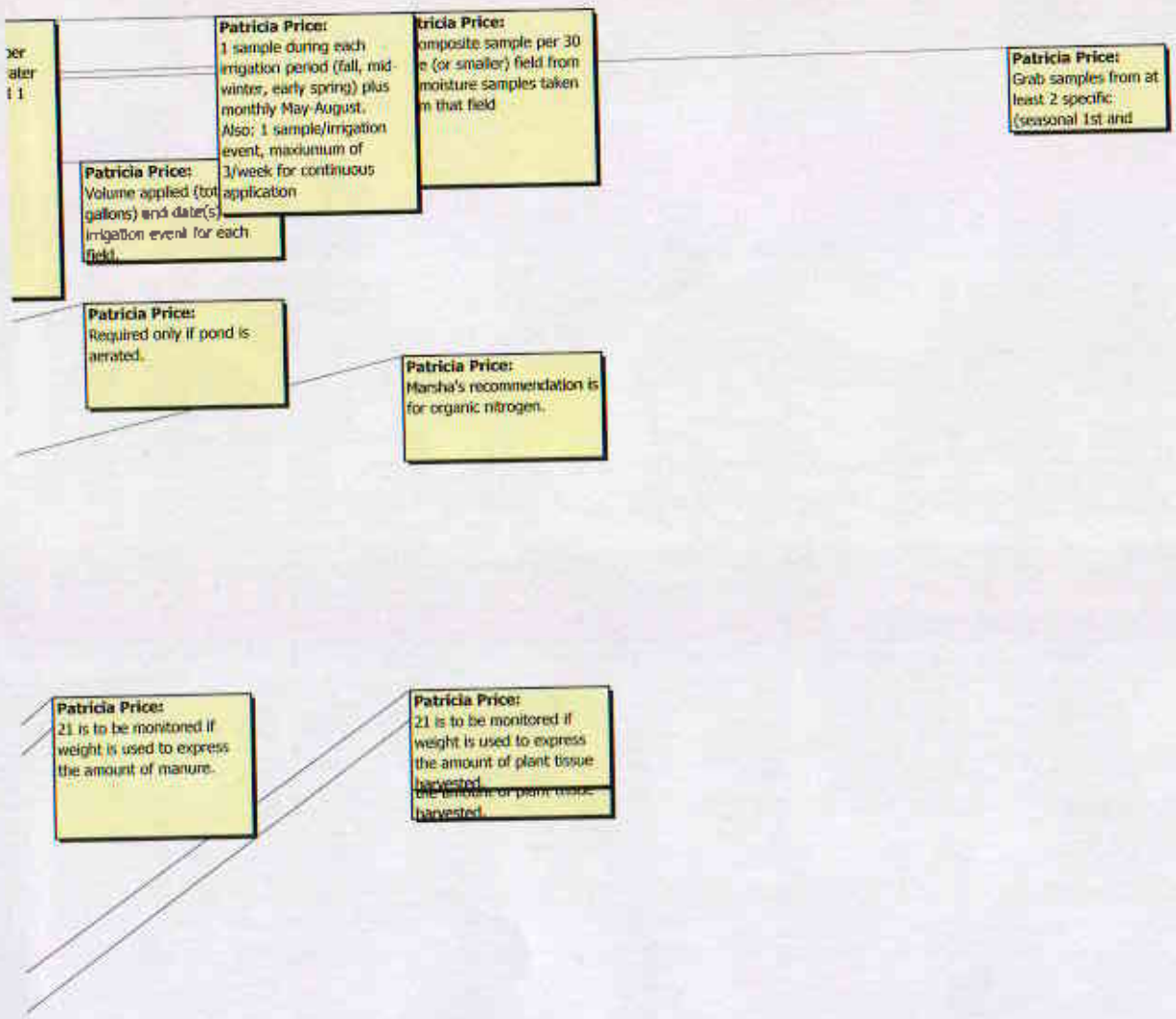
Monitoring should occur daily during discharge event.

*Should be monitored daily during discharge event.

Also: depth to groundwater from a surveyed reference point to the nearest 0.01 ft

Additionall
y: total dry
weight
applied
annually

[4] Liquid materials include process wastewater, irrigation water, irrigation return flows, storm water, and surface water.
[5] Solid materials include manure, soil, and plant tissue.
[6] Volume or weight of waste application or discharge.
[7] These parameters are to be measured in the field.
[8] Micromhos per centimeter (µmhos/cm).
[9] Electrical conductivity of: 1) liquid materials may be field measurements and 2) solid materials shall be laboratory measurements.
[10] Milligrams per liter (mg/l).
[11] NA – not applicable.
[12] pH shall be determined by laboratory analysis for soil an dmanure. pH for all other types of samples may be by field measurements.
[13] Milligrams per kilogram (mg/kg).
[14] Samples of soil, manure, process watewater, irrigation water, and groundwater shall be analyzed for ammonium-nitrogen. Samples of discharges of process wastewater, storm water tailwater t
[15] Samples of manure, process watewater, irrigation water, groundwater, and discharges of process wastewater, storm water, and tailwater to surface water shall be analyzed for total phosphorus
[16] General minerals include calcium, magnesium, sodium, bicarbonate, carbonate, sulfate, and chloride reported individually.
[17] Five-day Biochemical Oxygen Demand.
[18] Most probable number, five dilutions minimum.
[19] Manure shall be analyzed for moisture content (percent) when the amount of manure applied to a land application area or exported is expressed in weight (i.e., tons). Plant tissue shall be anal
[20] Manure denisty shall be analyzed when the amount of manure applied to a land application area or exported is expressed in volume (i.e., cubic yards). Plant denisty shall be analyzed for denis
[21] Grams per liter (g/l).
[22] Rainfall shall be reported to the nearest tenth of an inch.
[23] California Irrigation Management Information System (CIMIS) data from the nearest station.


Patricia Price:
1 sample during each irrigation period (fall, mid-winter, early spring) plus monthly May-August. Also: 1 sample/irrigation event, maximum of 3/week for continuous application
Patricia Price:
Grab samples from at least 2 specific (seasonal 1st and
Patricia Price:
Required only if pond is aerated.
Patricia Price:
Marsha's recommendation is for organic nitrogen.
Patricia Price:
21 is to be monitored if weight is used to express the amount of manure.
Patricia Price:
21 is to be monitored if weight is used to express the amount of plant tissue harvested

) surface water and samples of surface water shall be analyzed for total ammonia-nitrogen and unionized ammonia-nitrogen.
). Samples of soil shall be analyzed for soluble phosphorus as required in A.34.

lyzed for wet weight (percent) when the amount harvested is reported in weight (i.e., tons), but the constituent analyses expressed on a dry weight basis.
sty when the amount harvested is reported in volume (i.e., tons).

ATTACHMENT B

Waste Management Plan for the Production Area
For
Existing Milk Cow Dairies

A Waste Management Plan (WMP) for the production area is required for all existing milk cow dairies subject to Waste Discharge Requirements General Order No. ___ and shall address all of the items below. The portions of the WMP that are related to facility and design specifications (items II and III) must be prepared by, or under the responsible charge of, and certified by a civil engineer who is registered pursuant to California law or other person as may be permitted under the provisions of the California Business and Professions Code to assume responsible charge of such work.

The purpose of the WMP is to ensure that the production area of the dairy facility is designed, constructed, operated and maintained so that dairy wastes generated at the dairy are managed in compliance with Waste Discharge Requirements General Order No. ___ in order to prevent adverse impacts to groundwater and surface water quality.

I. A description of the facility that includes:

A. The name of the facility and the county in which it is located;

B. The address, Assessor's Parcel Number, and Township, Range, Section(s), and Baseline Meridian of the property;

C. The name(s), address(es), and telephone number(s) of the property owner(s), facility operator(s), and the contact person for the facility;

D. Present and maximum animal population as indicated below (this information is in the Report of Waste Discharge submitted in response to the Central Valley Water Board's 8 August 2005 request);

Type of Animals	Present Number of Animals	Maximum Number of Animals in Past 12 months	Breed of Animals
Milking Cows			
Dry Cows			
Heifers			
Calves			
Other types of commercial animals			

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E. Total volume (gallons) of process wastewater (i.e., milk barn washwater, fresh (not recycled) corral flush water, etc.) generated daily; and

F. A Site Map (or Maps) showing property boundaries and the following:

1. The location of the features of the production area including buildings, structures used for animal housing, corrals, holding ponds, solids separation facilities (settling basins or mechanical separators), other areas where animal wastes are deposited or stored, feed storage areas, process wastewater conveyance structures, process wastewater discharge points[DM1], process wastewater discharge/mixing points with irrigation water supplies, nearby surface waters, flow meter locations, pumping facilities, drainage controls (berms/levees, etc.), culverts, drainage easements, drainage flow directions, upstream diversion structures, any additional components of the waste handling and storage system, all water supply wells, and all groundwater monitoring wells;

2. The location of all cropland where wastes are applied (whether farmed by the Discharger or another party), features of all cropland including a field identification system (Assessor's Parcel Number; field code~~by name or~~ number; total acreage of each field; crops grown; indication if each field is owned, leased, or used pursuant to a formal agreement), indication what type of waste is applied (solid manure only, wastewater only, or both solid manure and wastewater) process wastewater conveyance structures, pumping facilities, drainage controls (berms, levees, etc.), culverts, drainage easements, drainage flow direction in each field, nearby surface waters, storm water discharge points, tailwater and storm water drainage controls, subsurface (tile) drainage systems (including discharge points and lateral extent), irrigation supply wells, groundwater monitoring wells, and sampling locations for discharges of storm water and tailwater to surface water from the field;

3. The location of all cropland that is part of the dairy but is not used for waste application including the Assessor's Parcel Number, total acreage, crops grown, and information on who owns or leases the field. The Waste Management Plan shall include verification that such cropland is covered under the Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated Lands (Order No. R5-2006-0053 for Coalition Group or Order No. R5-2006-0054 for Individual Discharger, or updates thereto);

4. The location of all off-property domestic wells within 600 feet of the production area or land application area(s) associated with the dairy and the location of all municipal supply wells within 1,500 feet of the production area or land application area(s) associated with the dairy.

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5. A map scale, elevation contours, a vicinity map, north arrow, and the date the map was prepared. The map shall be drawn on a published base map (i.e., a topographic map) using an appropriate scale that shows sufficient details of all facilities; and

II. An engineering report demonstrating that the existing facility has adequate containment capacity. The report shall include calculations showing if the existing containment structures are able to retain all facility process wastewater generated, together with all precipitation on and drainage through manured areas, up to and including during a 25-year, 24-hour storm.

A. The determination of the necessary storage volume shall reflect:

1. The maximum period of time, as defined in the Nutrient Management Plan (item VI.B of Attachment C), anticipated between land application events (storage period), which shall consider application of process wastewater or manure to the land application area as allowed by Waste Discharge Requirements General Order No. ____ using proper timing and rate of applications;

2. Manure, process wastewater, and other wastes accumulated during the storage period;

3. Normal precipitation or precipitation from a 25-year average rainfall water year less evaporation on the surface area during the entire storage period. If precipitation from a normal rainfall year is used in the calculation of necessary storage volume, the Waste Management Plan shall include a Contingency Plan as specified in II.C below;

4. Normal runoff or runoff from a 25-year average rainfall water year from the production area during the storage period. If runoff from a normal rainfall year is used in the calculation of necessary storage volume, the Waste Management Plan shall include a Contingency Plan as specified in II.C below;

5. 25-year, 24-hour precipitation on the surface (at the required design storage volume level) of the facility;

6. 25-year, 24-hour runoff from the facility's drainage area;

7. Residual solids after liquids have been removed; and

8. Necessary freeboard (one foot of freeboard for belowground retention ponds and two feet of freeboard for aboveground retention ponds).

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B. If the existing facility's storage capacity is inadequate, the WMP shall include proposed modifications or improvements. Any proposed modifications or improvements must be: prepared by, or under the responsible charge of, and certified by a civil engineer who is registered pursuant to California law or other person as may be permitted under the provisions of the California Business and Professions Code to assume responsible charge of such work; and include:

1. Design calculations demonstrating that adequate containment will be achieved;

2. A schedule for construction and certification of completion to comply with the Schedule of Tasks J.1 of Waste Discharge Requirements General Order No. ___; and

3. A Construction Quality Assurance Plan for any new containment structures proposed to increase containment capacity. The Construction Quality Assurance Plan must ensure that the pond is constructed to comply with applicable sections of Title 27, CCR, Division 2, Chapter 7, Subchapter 2, and General Specification B.5 of Waste Discharge Requirements General Order No _____.

C. Contingency Plan: If the necessary storage volume calculated in II.A or II.B above is based on normal runoff and/or precipitation rather than runoff or precipitation from a 25-year average rainfall water year (see II.A.3 and II.A.4 above), then the engineering report shall include a Contingency Plan that includes a plan on how the excess runoff and/or precipitation that is generated during a higher than normal wet season will be managed. If the Contingency Plan includes plans to discharge the excess runoff and/or precipitation to land without being in conformance with the NMP, then the Contingency Plan shall include a Monitoring Well Installation and Sampling Plan (MWISP) with a schedule for implementation that proposes monitoring wells to determine the impacts of such disposal on groundwater quality.

III. An engineering report showing if the facility has adequate flood protection. The report shall include a map and cross-sections to scale, calculations, and specifications as necessary. The report shall also describe the size, elevation, and location of all facilities present to protect the facility from inundation or washout as follows:

A. For facilities in the Sacramento River and San Joaquin River Basins showing if:

1. The retention ponds and manured areas at facilities in operation on or before November 27, 1984 are protected from inundation or washout by overflow from any stream channel during 20-year peak storm flow; or

2. Existing facilities in operation on or before November 27, 1984 that are protected against 100-year peak storm flows will continue such protection; or

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3. Facilities, or portions thereof, which began operation after November 27, 1984, are protected against 100-year peak storm flows.

B. For facilities in the Tulare Lake Basin showing if the facility is protected from overflow from stream channels during 20-year peak stream flows for facilities that existed as of 25 July 1975 and protected from 100-year peak stream flows for facilities constructed after 25 July 1975. Facilities expanded after 8 December 1984 must be protected from 100-year peak stream flows.

C. If the facility's flood protection does not meet these minimum requirements, the WMP shall include proposed modifications or improvements with the corresponding design to achieve the necessary flood protection and a schedule for construction and certification of completion to comply with the Schedule of Tasks J.1 of Waste Discharge Requirements General Order No. ____.

D. If the Discharger can provide to the Executive Officer an appropriate published flood zone map that shows the facility is outside the relevant flood zone, the above requirement for an engineering report showing adequate flood protection does not apply to that facility.

IV. A report assessing if the animal confinement areas, animal housing, and manure and feed storage areas are designed and constructed properly.

A. The report shall assess if the following design and construction criteria are met:

1. Corrals and/or pens are designed and constructed to collect and divert all process wastewater to the retention pond;

2. The animal housing area (i.e., barn, shed, milk parlor, etc.) is designed and constructed to divert all water that has contacted animal wastes to the retention pond; and

3. Manure and feed storage areas are designed and constructed to collect and divert runoff and leachate from these areas to the retention pond.

B. If the facility does not meet the above design and construction criteria, the WMP shall include proposed modifications or improvements to achieve the criteria and a schedule for construction and certification of completion to comply with the Schedule of Tasks J.1 of Waste Discharge Requirements General Order No. ____.

V. An operation and maintenance plan to ensure that:

A. All precipitation and surface drainage from outside manured areas, including that collected from roofed areas, is diverted away from manured areas, unless such

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drainage is fully contained and is included in the storage requirement calculations required in item II, above;

B. Ponds are managed to maintain the required freeboard and to prevent odors, breeding of mosquitoes, damage from burrowing animals, damage from equipment during removal of solids, embankment settlement, erosion, seepage, excess weeds, algae, and vegetation;

C. Holding ponds provide maximum pond capacity prior to winter storms (by October 1st at the latest), maintain capacity considering buildup of solids, and comply with the minimum freeboard required in Waste Discharge Requirements General Order No. ____;

D. There is no discharge of waste or storm water to surface waters from the production area;

E. Procedures have been established for removal of solids from any lined pond to prevent damage to the pond liner;

F. Corrals and/or pens are maintained to collect and divert all process wastewater to the retention pond and to prevent ponding of water and to minimize infiltration of water into the underlying soils;

G. The animal housing area (i.e., barn, shed, milk parlor, etc.) is maintained to collect and divert all water that has contacted animal wastes to the retention pond and to minimize the infiltration of water into the underlying soils;

H. Manure and feed storage areas are maintained to ensure that runoff and leachate from these areas are collected and diverted to the retention pond and to minimize infiltration of leachate from these areas to the underlying soils;

I. All dead animals are disposed of properly;

J. Chemicals and other contaminants handled at the facility are not disposed of in any manure or process wastewater, or storm water storage or treatment system unless specifically designed to treat such chemicals and other contaminants;

K. All animals are prevented from entering any surface water within the confined area; and

L. Salt in animal rations is limited to the amount required to maintain animal health and optimum production.

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VI. Documentation from a trained professional (i.e., a person certified by the American Backflow Prevention Association, an inspector from a state or local governmental agency who has experience and/or training in backflow prevention, or a consultant with such experience and/or training), as specified in Required Reports and Notices H.1 of Waste Discharge Requirements General Order No. ___, that there are no cross-connections that would allow the backflow of wastewater into a water supply well, irrigation well, or surface water as identified on the Site Map required in I.F above.

VII. The certification required in Required Reports and Notices H.3.a of Waste Discharge Requirements General Order No. ___.

[DM1]Does this imply each field, or every valve on every field?

ATTACHMENT C

Contents Of A Nutrient Management Plan
And
Technical Standards For Nutrient Management
For
Existing Milk Cow Dairies

Need to identify due date and certified individuals responsibilities in this section that correspond to Table 1 of the Order.

There is a difference between crop requirements, nutrient needs of a plant, and nutrient removal. It is important to keep one unit throughout. Suggest that nutrient removal be the unit of measure.

Waste Discharge Requirements General Order No. ___ (Order) requires owners and operators of existing milk cow dairies (Dischargers) who apply manure, bedding, or process wastewater, and/or who provide process wastewater to third parties for application, to land for nutrient recycling to develop and implement management practices that control nutrient losses and that are described in a Nutrient Management Plan (NMP). The purpose of the NMP is to budget and manage the nutrients applied to the land application area(s) considering all sources of nutrients, crop requirements, soil types, climate, and local conditions in order to prevent adverse impacts to surface water and groundwater quality. The NMP must take the site-specific conditions into consideration in identifying steps that will minimize nutrient movement through surface runoff or leaching past the root zone.

The NMP must contain, at a minimum, all of the elements listed below under Contents of a Nutrient Management Plan and must be in conformance with the applicable Technical Standards for Nutrient Management (Technical Standards), also listed below. Note that the NMP must be updated in response to changing conditions, monitoring results and other factors.

A ~~specialist~~ trained individual who ~~is certified~~has expertise in developing nutrient management plans shall develop the NMP. A ~~certified specialist~~trained individual is a ~~Professional Soil Scientist,~~ Professional Agronomist, Professional Crop Scientist, or Crop Advisor certified by the American Society of Agronomy or a Technical Service Provider certified in nutrient management in California by the Natural Resources Conservation Service (NRCS), or an operator trained to implement their NMP. The Executive Officer may approve alternative proposed specialists. Only NMPs prepared and signed by these parties will be considered ~~certified~~acceptable. [1]

Contents of a Nutrient Management Plan

The NMP will include the initial Preliminary Dairy Facility Assessment (Attachment A) and the annual updates as required by Monitoring and Reporting Program No. ____. Copies of these assessments shall be maintained for ~~10~~ 5years.[2]

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The NMP shall identify the name and address of the dairy, the dairy operator, and legal owner of the dairy property as reported in the Notice of Intent (Attachment A) and shall contain all of the following elements to demonstrate that the Discharger can control nutrient losses that may impact surface water or groundwater quality and comply with the requirements of the Order and the Technical Standards for Nutrient Management (Technical Standards).

I. Land Application Area Information

A. Identify each field under the Discharger's control where manure and/or process wastewater is (are) applied and each field under the control of a third party where the Discharger's process wastewater is applied. Each field shall be identified on a single published base map at an appropriate scale which also identifies in sufficient detail nearby surface waters, wastewater conveyance structures, pumping facilities, process wastewater mixing and/or distribution points with irrigation water supplies, flow meter locations, drainage controls (berms, levees, etc.) culverts, drainage easements, drainage flow directions in each field, tailwater and storm water drainage controls, storm water discharge points, subsurface (tile) drainage systems (including discharge points and lateral extent), irrigation supply wells, and sampling locations for discharges of storm water and tailwater to surface water from the field.

B. Provide the following information for each field identified in I.A above:

1. Field's common name.

2. Assessor's Parcel Number.

3. Total acreage.

4. Crops grown.

5. Information on who owns and/or leases the field.

6. Information on who has control over the application of dairy waste and other nutrient sources to the field.

7. Proposed sampling locations for discharges of storm water and tailwater to surface water.

8. Copies of any formal agreements for use of the field for the application of manure or process wastewater from the Discharger's dairy (Technical

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Standards V.A.1 and V.A.9 below) if the field is not owned, leased, or controlled by the Discharger.

C. Identify each field under the control of a third party where only solid manure from the Discharger is applied. Each such field shall be identified on a single published base map at an appropriate scale by the following:[3]

1. Assessor's Parcel Number.
2. Total acreage.
3. Crops grown.
4. Information on who owns or leases the field.
5. Information on who has control over the application of solid manure to the field.
6. Copies of any formal agreements for use of the field for the application of solid manure from the Discharger's dairy that specifies plans for the use and management of the offsite cropland (Technical Standards V.A.1 and V.A.9 below).

D. Identify each field under the control of the Discharger where neither process wastewater nor manure is applied. Each field shall be identified on a single published base map at an appropriate scale by the following:

1. Assessor's Parcel Number.
2. Total acreage.
3. Crops grown.
4. Information on who owns or leases the field.

II. Sampling and Analysis (see Technical Standard I below) **12 months and requires certified specialist** [4]

Identify the sampling methods, sampling frequency, and analyses to be conducted for soil, manure, process wastewater, irrigation water, and plant tissue analysis (Technical Standard I below).

III. Nutrient Budget (see Technical Standard V below)

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The Discharger shall develop a nutrient budget for each field identified in I.A above which establishes planned rates of nutrient applications for each crop based on ~~soil~~ [5] ~~test results,~~ manure and process wastewater analyses, crop nutrient requirements and patterns, seasonal and climatic conditions, the use and timing of irrigation water, and the nutrient application restrictions listed in Technical Standards V.A through V.D below. The Nutrient Budget shall include the following:

A. The rate of application of manure and process wastewater for each crop in each field (also considering sources of nutrients other than manure or process wastewater) to meet each crop's needs (from III.C above) without exceeding the application rates specified in Technical Standard V.B below. The basis for the application rates must be provided. [6]

B. The timing of applications for each crop in each field and the basis for the timing (Technical Standard V.C below). The maximum period of time anticipated between land application events based on proper timing and compliance with Technical Standard V.C. below. This will be used in the Waste Management Plan (item II.A of Attachment B) to determine the storage capacity needs.

C. The method of manure and process wastewater application for each crop in each field (Technical Standard V.D below).

D. If phosphorus and/or potassium applications exceed the amount of these elements removed from the field in the harvested portion of the crop~~.~~, Tthe soil and crop tissue analyses results shall be reviewed by an agronomist at least every five years. If this review determines that the buildup of phosphorus or potassium threatens to reduce the long-term productivity of the soil or the yield, quality or use of the crops grown, application rates will be adjusted downward to prevent or correct the problem.

~~IV.~~Setbacks, Buffers, and Other Alternatives to Protect Surface Water (see Technical Standard VII below)

A. Identify all potential surface waters or conduits to surface water that are within 100 feet of any field identified in I.A above where manure or process wastewater is applied.

B. For each field that has been identified in I.A above to be within 100 feet of a surface water or a conduit to surface water, identify the setback, vegetated buffer, or other alternative practice that will be implemented to protect surface water (Technical Standard VII below).

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V. Field Risk Assessment (see Technical Standard VIII below) due in 12

A. Identify erosion, runoff, and water management control measures, conservation practices, and management activities used, and each one's ability, to (1) reduce the potential for movement of nitrogen and phosphorus from each land application area identified in I.A above to surface water and groundwater (Technical Standard VIII.A below) and (2) comply with Technical Standard VI below (Wastewater Management).

B. Identify concentrations of nitrogen and phosphorus present in discharges of manure, process wastewater, tailwater, subsurface (tile) drainage, -or storm water from each field identified in I.A above to surface water (Technical Standard VIII.B below). Due 16 mos by certified specialist This should not require a certified specialist. A nutrient management type individual may provide technical assistance to reduce nutrient loads to tile drains.

C. Identify methods and a schedule to further control any observed discharges of nitrogen or phosphorus identified in V.III.B above. Due 16 months by certified specialist A nutrient management specialist is not likely qualified to tackle this need.

VI. Record-Keeping (see Technical Standard IX below)

Identify the records that will be maintained for each land application area identified in I.A above.

VII. Nutrient Management Plan Review (see Technical Standard X below)

A. Identify the schedule for review and revisions to the NMP.

B. Identify the person who will conduct the NMP review and revisions.

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Technical Standards for Nutrient Management

The Discharger shall comply with the following Technical Standards for Nutrient Management in the development and implementation of the Nutrient Management Plan (NMP).

I. Sampling and Analysis due 12 mos[7]

Soil, manure, process wastewater, irrigation water, and plant tissue shall be monitored, sampled, and analyzed as required in Monitoring and Reporting Program No. ____, and any future revisions thereto. The results of these analyses shall be used during the development and implementation of the NMP.

II. Crop Requirements

A. Realistic yield goals for each crop in each field shall be established. For new crops or varieties, industry yield recommendations may be used until documented yield information is available.

B. Each crop's nutrient requirements for nitrogen, phosphorus, and potassium shall be determined based on recommendations from the University of California, *Western Fertilizer Handbook* (9th Edition), or from historic crop nutrient removal.

III. Available Nutrients

A. All sources of nutrients (nitrogen, phosphorus, and potassium) available for each crop in each field shall be identified prior to land applications. Potential nutrient sources include, but are not limited to, manure, process wastewater, irrigation water, commercial fertilizers, soil, and previous legume crops.

B. Nutrient values of soil, manure, process wastewater, and irrigation water shall be determined based on laboratory analysis. "Book values" for manure and process wastewater may be used for planning of first year application(s) during initial development of the NMP if necessary. Acceptable book values are those values recognized by American Society of Agricultural and Biological Engineers (ASABE), the NRCS, and/or the University of California that accurately estimate the nutrient content of the material. The nutrient content of commercial fertilizers shall be derived from the published values certified by the California Department of Food and Agriculture.

C. Nutrient credit from previous legume crops shall be determined by methods acceptable to the University of California Cooperative Extension, the Natural

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Resources Conservation Service (NRCS), or a ~~specialist certified~~trained individual in developing nutrient management plans.

IV. Overall Nutrient Balance

The total of nutrients generated at the dairy from manure and process wastewater plus the total nutrients ~~available in soil~~in, planned applications of commercial fertilizers, irrigation water, and previous legume [8]crops shall not exceed the ~~total~~ targeted nutrient[9] application ~~requirements~~ for all crops in all of the land application areas, unless the Discharger implements management practices (such as offsite removal of the excess nutrients, treatment, or storage) that will prevent impacts to surface water or groundwater quality due to the excess nutrients.

V. Nutrient Budget

The NMP shall include a nutrient budget which includes planned rates of nutrient applications for each crop that do not exceed ~~the crop's requirements~~1.5 x estimated crop removal for total nitrogen at the time of application considering the stage of crop growth and that also considers all nutrient sources, climatic conditions, the irrigation schedule, and the application limitations in A through D below.

A. General Standards for Nutrient Applications

1. Prohibition A.8 of the Order: "*The application of waste to lands not owned, leased, or controlled by the Discharger without written permission from the landowner or in a manner not approved by the Executive Officer, is prohibited.*"

2. Prohibition A. 9 of the Order: "*The land application of manure or process wastewater for other than nutrient recycling is prohibited.*"

3. General Specification B.14 of the Order: "*The application of manure or process wastewater to the land application area must be done in a manner that is consistent with a NMP that is developed as required in Required Reports and Notices H.2.b.*"

4. Land Application Specification C.2 of the Order: "*Land application of process wastewater to offsite property under third party control shall be conducted (1) in accordance with a certified NMP consistent with the technical standards for nutrient management as specified in Attachment C and (2) under a written formal agreement, which shall be included in the Discharger's NMP. The Discharger shall include management of such land application areas as part of the Discharger's NMP (see Contents of a Nutrient Management Plan in Attachment C).*"

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5. Land Application Specification C.3 of the Order: "*The Discharger shall have a written agreement with any third party that has control on the use of solid manure provided by the Discharger. The written agreement with the third party shall be included in the Discharger's NMP and shall specify plans for the use and management of the third party's land application area. Land application areas under control of a third party that receive solid manure from the Discharger will be regulated under the Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated Lands (Order No. R5-2006-0053 for Coalition Group or Order No. R5-2006-0054 for Individual Discharger).*"

6. Land Application Specification C.5 of the Order: "*The application of waste from manure and other sources for nutrient recycling to any cropland under control of the Discharger shall meet the following conditions:*

   a. *The application is in accordance with a certified NMP developed and implemented in accordance with Required Reports and Notices H.2.b and Attachment C of this Order; and*

   b. *Records are prepared and maintained as specified in Record-Keeping Requirements of Monitoring and Reporting Program No. ____.*"

7. Land Application Specification C.6 of the Order: "*The application of manure, process wastewater or other wastes to cropland shall be at rates that preclude development of vectors or other nuisance conditions and meet the conditions of the certified NMP.*"

8. Land Application Specification C.8 of the Order: "*All applied process wastewater must infiltrate completely within 72 hours after application.*"

9. Land Application Specification C.9 of the Order: "*Process wastewater shall not be applied to land application areas during periods when the soil is at or above field moisture capacity unless consistent with a certified NMP.*"

10. Provision E.5 of the Order: "*This Order does not apply to facilities where wastes such as, but not limited to, whey, cannery wastes, septage, sludge, biosolids, ash or similar types of waste are generated onsite or are proposed to be brought onto the dairy or associated cropland for the purpose of nutrient recycling or disposal. The Discharger shall submit*

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a complete Report of Waste Discharge and receive WDRs or a waste-specific waiver of WDRs from the Central Valley Water Board prior to receiving this waste."

11. Provision E.7 of the Order: "*If plans for animal waste include application to land not under ownership of the Discharger, the Discharger's NMP shall include this land as specified in Attachment C and the Discharger shall provide to the Executive Officer a copy of a written agreement with the property owner that specifies plans for the use and management of the offsite cropland.*"

12. Plans for nutrient management shall specify the form, source, amount, timing, and method of application of nutrients on each field to minimize nitrogen and/or phosphorus movement to surface and/or ground waters to the extent necessary to meet the provisions of the Order.

13. Where crop material is not removed from the field, waste applications are not allowed. For example, if a pasture is not grazed or mowed (and cuttings removed from the field), waste shall not be applied to the pasture.

14. Manure and/or process wastewater will be applied to the field for use by the first crop covered by the NMP only to the extent that soil tests indicate a need for nitrogen application.

15. Supplementary commercial fertilizer(s) and/or soil amendments may be added when the application of nutrients contained in manure and/or process wastewater alone is not sufficient to meet the crop needs, as long as these applications do not exceed provisions of the Order.

16. Nutrient applications to a crop shall not be made prior to the harvest of the previous crop.

17. Water applications shall not exceed crop water use requirements except where leaching is required to control salt levels in the soil. Leaching amounts shall not exceed the leaching requirements (leaching fraction) calculated using procedures in "Water Quality for Agriculture" by R.S. Ayers and D.W. Westcot, Food and Agriculture Organization of the United Nations Paper 29, Revision 1, 1985.

18. Nutrients shall be applied in such a manner as not to degrade the soil's structure, chemical properties, or biological condition.

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B. Nutrient Application Rates

1. General

a. Planned rates of nutrient application shall be determined based on soil test results, nutrient credits, manure and process wastewater analysis, crop requirements and growth stage, seasonal and climatic conditions, and use and timing of irrigation water. Actual applications of nitrogen to any crop shall be limited to the amounts specified below.

b. Nutrient application rates shall not attempt to approach a site's maximum ability to contain one or more nutrients through soil adsorption. Excess applications or applications that cause soil imbalances should be avoided. Excess manure nutrients generated by the Discharger must be handled by export to a good steward of the manure, or the development of alternative uses.

2. Nitrogen

~~a.~~Total nitrogen applications to a field prior to and during the growing of a crop shall not exceed 1.~~0~~ 4 to 1.6 times the total nitrogen removed from the field through the harvest and removal based on crop history ~~of the previous crop~~. [10]~~Additional applications of nitrogen are allowable if the following conditions are met:~~

~~i.Plant tissue testing has been conducted and it indicates that additional nitrogen is required to obtain a crop yield typical for the soils and other local conditions;~~

~~ii.The amount of additional nitrogen applied is based on the plant tissue testing and is consistent with University of California Cooperative Extension written guidelines or written recommendations from a professional agronomist;~~

~~iii.The form, timing, and method of application make the nitrogen immediately available to the crop; and~~ [11]

~~iv.~~i. ~~Records are maintained documenting the need for additional applications.~~

b. At no time will application rates result in total nitrogen applied to the land application area exceeding 1.65 times the total nitrogen

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removed from the field through the harvest and removal of the previous crop.

c. If, in ~~calendar~~ the nutrient management year beginning 2010-2011 or in later years, application of total nitrogen to a field exceeds 1.65 times total nitrogen removed from the field through the harvest and removal of the previous crop, and the irrigation leaching fraction (see V.A.15) for the field exceeds 1.2, the Discharger shall revise the NMP to prevent these exceedances.

3. Phosphorus and Potassium

a. Phosphorus and potassium may be applied in excess of crop uptake rates. If, however, monitoring indicates that levels of these elements are causing adverse impacts, corrective action must be taken. Cessation of applications may be necessary until crop uptake and harvest has reduced the concentration in the soil.

Important Note:
Use of animal manure as a primary source of nitrogen commonly results in applications of phosphorus and potassium at rates that exceed crop needs. Over time, these elements build up in the soils and can cause adverse impacts. For example, phosphorus ~~will~~ may leave the field associated with solids due to ~~in~~ surface runoff and ~~contribute to excessive algae growth~~contribute to surface water nutrient enrichment [12]in receiving waters and potassium can build up in crops to the point of limiting their use as animal feed. Application of these nutrients at agronomic levels, along with reasonable erosion control measures, will normally prevent such problems.

Nutrients are being evaluated in several Central Valley surface waters. Where these studies show that nutrients are adversely impacting beneficial uses, the Regional Water Board will work with parties in the watershed, including dairies, to reduce discharges of phosphorus, nitrogen and possibly other constituents.

C. Nutrient Application Timing

1. ~~Process wastewater application is not the same as irrigation.~~ Process wastewater application scheduling should be based on the nutrient needs of the crop, the daily water use of the crop, the water holding capacity of the soil, and the lower limit of soil moisture for each crop and soil.

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2. ~~The application of process wastewater is not allowed during weeks of the year when historical records for the area indicate that rainfall exceeds crop water demand. .~~[13]The NMP shall identify these weeks and during this period application of irrigation water (without waste) is only allowed if an extended dry spell places the crop at risk.

3. The timing of nutrient application must correspond as closely as possible with plant nutrient uptake characteristics, while considering cropping system limitations, weather and climatic conditions, and field accessibility.

4. ~~The Discharger shall avoid winter nutrient application for spring-seeded crops~~[14]~~.~~

5. Except for orchards, nutrients shall not be applied during periods when a crop is dormant.

D. Nutrient Application Methods

1. The Discharger shall apply nutrient materials as uniformly as possible to application areas or as prescribed by precision agricultural techniques[15].

2. Land Application Specification C.4 of the Order: "*Land application areas that receive dry manure shall be managed to minimize erosion and to prevent the discharge of storm water to surface water unless consistent with a Nutrient Management Plan. Except on pasture or alfalfa, dry manure shall be incorporated into the soil as soon as practicable, but no later than 48 hours after application.*"

VI. Wastewater Management on Land Application Areas

Control of water and process wastewater applications and runoff is a part of proper nutrient management since water transports nutrients, salts, and other constituents from cropland to groundwater and surface water. The Discharger shall comply with the following provisions of the Order, which place requirements on applications of manure and process wastewater to, and runoff from, cropland:

A. Prohibition A.3 of the Order: "*The discharge of waste from existing milk cow dairies to surface waters which causes or contributes to an exceedance of any applicable water quality objective in the Basin Plans or water quality criteria set forth in the California Toxics Rule and the National Toxics Rule is prohibited.*"

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B. Prohibition A.4 of the Order: **"***The discharge or disposal of waste from existing milk cow dairies that results in pollution or nuisance is prohibited*."

C. Prohibition A.10 of the Order: "*The discharge of wastewater to surface waters from cropland is prohibited. Irrigation supply water that comes into contact or is blended with waste or wastewater shall be considered wastewater under this Prohibition.*"

D. Prohibition A.11 of the Order: "*The application of process wastewater to a land application area before, during, or after a storm event that would result in runoff of the applied water is prohibited.*"

E. Prohibition A.12 of the Order: "*The discharge of storm water to surface water from a land application area where manure or process wastewater has been applied is prohibited unless the manure has been incorporated into the soil and the land application area has been managed consistent with a certified Nutrient Management Plan (NMP*)."

F. General Specification B.1 of the Order: "*The collection, treatment, storage, or disposal of wastes at an existing milk cow dairy shall not result in: a discharge of waste constituents in a manner which could cause degradation of surface water or groundwater except as allowed by this Order, contamination or pollution of surface water or groundwater, or a condition of nuisance (as defined by the California Water Code Section 13050).*"

G. Land Application Specification C.4 of the Order: "*Land application of wastes for nutrient recycling from existing milk cow dairies shall not cause the underlying groundwater to contain any waste constituent, degradation product, or any constituent of soil mobilized by the interactions between applied wastes and soil or soil biota, to exceed the groundwater limitations set forth in this Order.*"

H. Land Application Specification C.8 of the Order: **"***All applied process wastewater must infiltrate completely within 72 hours after application*."

I. Land Application Specification C.9 of the Order: "*Process wastewater shall not be applied to land application areas during periods when the soil is at or above field moisture capacity unless consistent with a certified NMP*."

VII. Setbacks and Vegetated Buffer

A. Land Application Specification C.10 of the Order: "*Manure and process wastewater shall not be applied closer than 100 feet to any down gradient surface waters, open tile line intake structures, sinkholes, agricultural or*

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domestic well heads, or other conduits to surface waters, unless a 35-foot wide vegetated buffer is substituted for the 100-foot setback or alternative conservation practices or field-specific conditions will provide pollutant reductions equivalent or better than the reductions achieved by the 100-foot setback."[16]

B. A setback is a specified distance from surface waters or potential conduits to surface waters where manure and process wastewater may not be land applied, but where crops may continue to be grown.

C. A vegetated buffer is a narrow, permanent strip of dense perennial vegetation where no crops are grown and which is established parallel to the contours of and perpendicular to the dominant slope of the field for the purposes of slowing water runoff, enhancing water infiltration, trapping pollutants bound to sediment, and minimizing the risk of any potential nutrients or pollutants from leaving the field and reaching surface waters.

D. The minimum widths of setbacks and vegetated buffers must be doubled around the wellhead of a drinking water supply well constructed in a sole-source aquifer.

E. Practices and management activities for vegetated buffers include the following:

1. Removal of vegetation in vegetated buffers will be in accordance with site production limitations, rate of plant growth, and the physiological needs of the plants.

2. Do not mow below the recommended height for the plant species.

3. Maintain adequate ground cover and plant density to maintain or improve filtering capacity of the vegetation

4. Maintain adequate ground cover, litter, and canopy to maintain or improve infiltration and soil condition.

5. Periodic rest from mechanical harvesting may be needed to maintain or restore the desired plant community following episodic events such as drought.

6. When weeds are a significant problem, implement pest management to protect the desired plant communities.

7. Prevent channels from forming.

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VIII. Field Risk Assessment

A. The Discharger shall assess the ability of any erosion, runoff, or water management control measures, conservation practices, and management activities to (1) reduce the potential for movement of nitrogen and phosphorus from each land application area and (2) comply with Technical Standard VI (Wastewater Management).

B. The results of the Discharge and Surface Water Monitoring, Tailwater Monitoring, and Storm Water Monitoring for each land application area required by Monitoring and Reporting Program No.___ shall be used by the Discharger to assess the movement of nitrogen and phosphorus from each land application area where manure and/or process wastewater is applied.

IX. Record-Keeping

The Discharger shall maintain records for each land application area as required in Monitoring and Reporting Program No.___ (Monitoring Provisions 37.c, 37.d, and 37.f).

X. Nutrient Management Plan Review

A. The NMP shall be updated when discharges from any land application area exceed water quality objectives, a nutrient source has changed, site-specific information has become available to replace defaults values used in the overall nutrient balance or the nutrient budget, or nitrogen application rates in any field where manure and/or process wastewater is applied exceed the rates specified in Technical Standard V.B.

B. The NMP shall be updated prior to any anticipated changes that would affect the overall nutrient balance or the nutrient budget such as, but not limited to, a crop rotation change, changes in the available cropland, or the changes in the volume of process wastewater generated.

C. The Discharger shall review the NMP at least once every 5 years and notify the Regional Board in the annual report of any proposed changes that would affect the NMP.

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[1]Individuals responsible for writing NMP need to be knowledgeable ~~with~~ of manure application and associated nuances on dairy operations. Professional soil scientists (absent the other professional certificates) predominantly address erosion and may not have any knowledge of crops and nutrient/crop relationships. These certifications identified do not guarantee that the individual has knowledge, skills, or abilities with cropping systems where manure is utilized. The information to be put in the plan may well be boiler plate and if a uniform tool is utilized then the question is why can't a producer do it themselves? The recommendation is that the certified specialist be required only when operators deviate from proposed guidelines. The requirement to have a signature for a plan when the NMP prohibits application beyond 1.65 it is questionable to require a signature.

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[2]A template needs to be developed that is acceptable with RB5 needs—maybe this is the Purdue Planner NRCS is doing or maybe not. However, it is critical that this be accomplished to allow RB staff to adequately and efficiently evaluate NMP and to realistically provide a means for dairy producers to comply with requirements. The University is dedicated to working with RB5 to assist in development of a workable tool once the final WDR is completed.

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[3]Suggest that this be streamlined. Solid manure sold or given away will have a manifest. Once under the control of a third party this information may not be known.

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[4]Identify in each section the expectation for completion and the need for assistance from certified or trained individuals.

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[5]The soil test results are 1 in 5 years and should not be used for annual nutrient management plans. This is not a technically sound requirement. Furthermore, to adequately calculate the budget, one would need to account for soil nutrients prior to and post crop season.

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[6]It is anticipated that the information RB will receive identifies the approximate estimate of season nutrient application amount. Examples include 2/3 at first irrigation, 1/3 at third irrigation; or a more detailed x lbs of nutrient per irrigation with assumed N content, ratio and mineralization.

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[7]This is an example. We recommend that at each section the due date and requirement for participation by a trained individual be clearly identified.

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[8]The balance described needs to have "available in soil removed" to be a true balance. Once soil is removed, the balance actually does compare inputs to outputs. Addition of soil to inputs creates significant challenges, considerable variability, and is technically unsound when the soil is sampled at 5 year intervals. Results from research in California indicate that once a consistent organic N application program is implemented, equilibrium is reached within 3-5 years. Under these conditions, N mineralization equilibrium is reached.

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[9]Nutrient requirements are greater than harvested nutrient removal and that is why the requirement of 1 x is impossible.

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[10]It is physically and biologically impossible to achieve 100% efficiency (inputs = removal). Requiring this objective will result in yield losses resulting in economic losses to the operator. The reduced yields will most probably result in application rates that fell into the 1.4 to 1.6 value. The suggested range is explained in detail in the report provided to RB5 from UC.

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[11]This precludes the land application of organic N (i.e. solid and liquid manures).

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[12]State 303(d) impaired waterway list for CA identifies nutrient enrichment. The situations resulting in

algae blooms due to P enrichment are not consistent in CA. It is important to realize that erosion is the key item to control to reduce P entering surface water.

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[13] Prohibition A.11 and Land application specification C.8 are sufficient. There is no need to prohibit applications of manure sources due to weather. In some locations applications when fields have recently received rain allow for more uniform application and result in groundwater protection. This of course, requires adequate handling of any field runoff. If applications are prohibited herein, the NMP is inconsistent with the Order.

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[14]This provision is unnecessary. The cap of 1.65 is sufficient and does not require the RB to dictate specific management strategies. There may be situations where application in winter for spring seeded crops is desirable.

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[15]Recommendations—either alter sentence to say "as uniformly as possible" or realize that the 1.65 cap on N application will address this and a uniformity requirement is unnecessary.

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[16]If the concern is direct contact of manure nutrients with wellheads then it should be acceptable to have a sufficiently built barrier to prohibit this contact. It seems that a well managed tailwater return system would be sufficient to protect surface waters. There was no scientific reason to select 100-foot setback or 35 foot wide vegetated buffer in the CAFO rule. Vegetative buffers are most useful to reduce sediment load under low flow conditions. The higher the flow of water through the buffers the less apt the buffers are to reduce sediment load. What 'reduction would be achieved' by the 100' setback? Include "or physical barrier sufficient to prevent inundation of the wellhead" or alternative conservation practices.